

THE IRON AGE

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Reading Matter Contents.....page 1233
Alphabetical Index to Advertisers " 215
Classified List of Advertisers " 206
Advertising and Subscription Rates " 1251

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SEE PAGE 25



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THE IRON AGE

New York, Thursday, April 18, 1907.

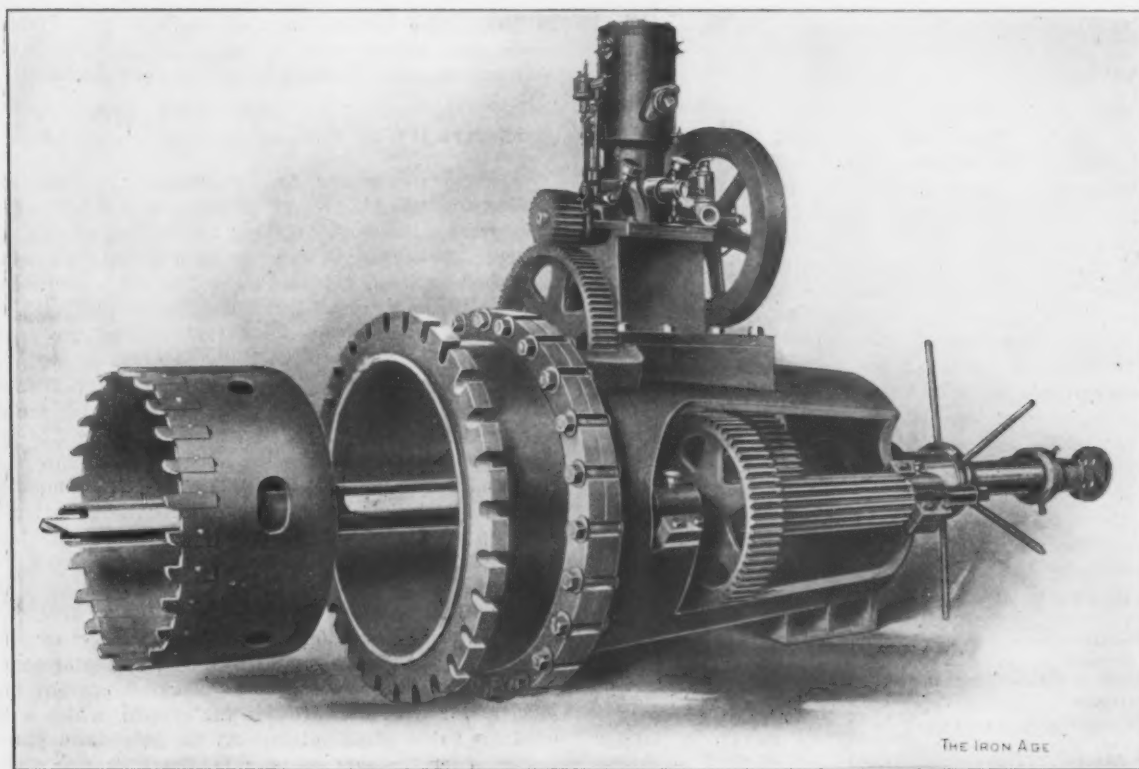
A Water Main Tapping Machine.

A novel use for a small gas engine is its application to a tapping machine used for making connections with water mains. The Water Works Equipment Company, 180 Broadway, New York, recently built a machine capable of making a 30-in. connection with a 30-in. water main, which is operated by a 6½-hp. Mianus gasoline engine, and the innovation has proved so successful that the company is now equipping its tapping machines of various sizes with gasoline engines for power drive in place of hand power operation.

The machine shown in the accompanying illustration was successfully used at Trenton, N. J., recently in making a connection without shutting off the water in the main, and it substantiated the contention that with these machines, branch connections of sizes ranging from small

used. The sleeve is a special fitting of tee form, in which the cross or run of the tee is separable longitudinally on a central plane perpendicular to the side branch so that it may be bolted together, surrounding the main to be tapped, with the point where the hole is to come covered by the side branch of the tee. The valve is of any standard gate form, and is connected between the side branch and the flange of the frame of the tapping machine. After the connections are made and the valve opened, the tapping operation is carried on within the branch.

In the work as done at Trenton a 1½-in. hole was first cut in the main by the leading off drill and a 4-in. hole was made by the small cutter, thus allowing the main shaft of the 30-in. cutter to be inserted in the pipe. This cutter was then operated until the 30-in. hole was cut in the shell of the pipe. To cut the 1½-in. hole and the 4-in. hole took 30 min., and to cut the 30-in. hole took



The No. 4 Gasoline Engine Driven Tapping Machine for Making 30, 36, 42 and 48 In. Connections to Water Mains, Built by the Water Works Equipment Company, New York City.

ones for domestic house service to a 48-in. branch can be made without shutting off the water. The machine and engine complete weighs about 5500 lb.

The engine is bolted to the frame of the tapping machine and the pinion on its shaft meshes a large gear operating a second pinion inside of the frame, which in turn drives the large gear exposed at the open side of the frame in the illustration. The latter gear is on the same shaft with a long pinion which meshes with a gear on the boring spindle and allows it to be shifted longitudinally as the feeding of the spindle progresses. The feeding of the spindle is accomplished by rotating the pilot wheel shown at the rear of the machine. At the cutting end of the boring spindle is a leading off drill, which guides a 4-in. cutter. The hole made by the latter is large enough to allow the shaft of the large cutter to be introduced, and a series of spring catches on the shaft serve to hold the piece of pipe after it is cut out by the 30-in. cutter.

To tap a main under pressure a sleeve and valve are

used. During the whole operation 2½ gal. of gasoline were consumed, which at 15 cents per gallon cost about 45 cents. When the piece of pipe cut out by the machine was removed past the gate, the latter was closed until the machine was detached and the outer end of the valve was then connected up with the branch line.

The sleeve supplied by the Water Works Equipment Company has a special flanged joint for securing the halves together, and is arranged to use cement instead of lead for filling the bulk of the space between the cast iron sleeve and the main pipe. At the hubs or bells it is necessary to use lead. The sleeve flanges, instead of having a full bearing against each other where they are bolted together, touch only at the outside edges, leaving a space of triangular cross section between them. The joint faces are about 1½ in. wide, and between them a ¼-in. lead gasket is placed. When the bolts are tightened more pressure is brought upon the joint faces and the gasket than would be the case if the full face of the flanges were in contact.

Open Hearth Steel in 1906.

Total Production, 10,970,998 Gross Tons, and of All Kinds of Steel, 23,365,000 Tons.

The American Iron and Steel Association has completed the collection of the statistics of open hearth steel production in the United States in 1906. The total of open hearth ingots and direct castings was 10,970,998 gross tons, an increase of 1,999,622 tons, or 22.2 per cent, as compared with the figures for 1905, which were 8,971,376 tons. The production for 1906 was much larger than that of any other year, and was only 1,304,255 tons less than the Bessemer steel output last year—12,275,253 tons. General Manager James M. Swank estimates that when the statistics of crucible and miscellaneous steel ingots and castings are completed it will be found that the total of all kinds of steel ingots and castings produced in this country in 1906 approximated 23,365,000 gross tons. The following table gives the production of open hearth steel ingots and castings by States since 1903, in gross tons:

States.—Gross tons.	1903.	1904.	1905.	1906.
New England.....	169,209	195,901	239,282	251,047
New York and New Jersey	104,598	165,986	348,072	553,186
Pennsylvania	4,442,730	4,306,498	6,471,818	7,710,949
Illinois	422,919	358,215	617,625	884,472
Ohio	369,349	480,906	687,392	816,483
Other States.....	321,106	400,660	607,187	754,861
Totals.....	5,829,911	5,908,166	8,971,376	10,970,998

Basic and Acid Steel.

The production of basic open hearth steel in 1906 was 9,649,385 gross tons, and of acid open hearth steel 1,321,613 tons, while in 1905 the production by the basic process amounted to 7,815,728 tons and by the acid process to 1,155,648 tons. This is a gain in production in 1906 over 1905 by the basic process of 1,833,657 tons and by the acid process of 165,965 tons. In 1904 the production of basic open hearth steel was 5,106,367 tons and of acid steel, 801,799 tons.

Pennsylvania made 68.4 per cent. of the total production of basic steel ingots and castings in 1906 and 83.6 per cent. of the total production of acid steel ingots and castings, against 70.3 per cent. of basic and 84.1 per cent. of acid ingots and castings in 1905. Illinois and Ohio were the next largest producers of open hearth steel in each of these two years. The table below shows the production by States of both basic and acid open hearth steel ingots and castings in 1906:

States.—Gross tons.	Basic open hearth steel.	Acid open hearth steel.	Totals.
New England.....	184,307	66,740	251,047
New York and New Jersey.	520,422	32,764	553,186
Pennsylvania	6,605,912	1,105,037	7,710,949
Illinois	878,548	5,924	884,472
Ohio	755,936	60,547	816,483
Other States.....	704,260	50,601	754,861
Totals.....	9,649,385	1,321,613	10,970,998

Ingots and Castings.

The production of open hearth steel ingots in 1906, excluding castings, amounted to 10,257,841 tons, against 8,444,836 tons in 1905, an increase of 1,813,005 tons, or over 21.4 per cent. The production of castings alone in 1906 amounted to 713,157 tons, against 526,540 tons in 1905, an increase of 186,617 tons, or over 35.4 per cent. The following table gives in gross tons the production of basic and acid open hearth steel ingots in 1906, by States:

States.—Gross tons.	Basic ingots.	Acid ingots.	Totals.
New England, New York and New Jersey.....	666,196	48,527	714,723
Pennsylvania	6,581,872	829,079	7,410,951
Illinois, Ohio and other States	2,095,563	36,604	2,132,167
Totals.....	9,343,631	914,210	10,257,841

The production of open hearth steel castings in 1906 was much the largest in the country's history. The year of next largest production was 1905. Of the total production in 1906 407,403 tons, or over 57.1 per cent., was made by the acid process, and 305,754 tons, or almost 42.9 per cent., by the basic process. As compared with 1905, when 320,381 tons of castings were made by the

acid process, the increase in 1906 by this process was 87,022 tons. By the basic process the increase was 99,595 tons, the production by this process in 1905 having amounted to 206,159 tons. The following table gives the production of open hearth steel castings by both the basic and acid processes in 1906 by States, in gross tons:

States.—Gross tons.	Basic castings.	Acid castings.	Total.
New England, New York and New Jersey	38,533	50,977	89,510
Pennsylvania	24,040	275,958	299,998
Illinois, Ohio and other States.....	243,181	80,468	323,649
Totals.....	305,754	407,403	713,157

The production of Bessemer steel castings in 1906, heretofore reported, was approximately 32,000 tons.

Active Open Hearth Works.

The number of open hearth steel plants in the United States is growing. The open hearth steel made in 1906, including both ingots and castings, was produced by 124 works in 20 States, as follows: Massachusetts, 4; Connecticut, 3; Rhode Island, 1; New York, 8; New Jersey, 5; Pennsylvania, 61; Delaware, 1; Maryland, 1; West Virginia, 1; Georgia, 1; Alabama, 5; Ohio, 13; Indiana, 3; Illinois, 7; Michigan, 2; Wisconsin, 4; Missouri, 1; Minnesota, 1; Colorado, 1, and California, 1. West Virginia, Georgia and Minnesota made no open hearth steel in 1905, but all appear among the producers in 1906. One hundred and eleven works in 17 States made open hearth steel in 1905, and 116 works in 16 States made open hearth steel in 1904.

Electricity at the Jamestown Exposition.

Electric power for the approaching exposition at Jamestown, like that at the Buffalo Pan-American, will come from a distance. Having no Niagara to rely upon, however, power for the Jamestown Exposition will be furnished by steam turbines located in the power house of the Norfolk Railway & Light Company, about 7 miles from the exposition grounds. This fair will be the first at which the electric power will be generated by steam turbines. The machines will be of the Curtis type, these as well as the complete electrical equipment being supplied by the General Electric Company.

The exposition authorities have entered into a contract with the Norfolk Railway & Light Company to furnish all the electricity required for illumination and power purposes. The electricity generated at the Jamestown power house will be transmitted on specially constructed lines to a model substation in Machinery Hall. Here will be located the transforming and distributing apparatus. This equipment consists of large air cooled transformers and many smaller type H transformers for general illumination as well as constant current transformers for the series-arc lighting system, which will be used for police illumination. At the substation also are motor generator sets to provide direct current for the operation of searchlight and small motors where they may be installed by exhibitors.

The switchboard for controlling the various circuits throughout the exposition grounds is located in a gallery and is typical of modern switchboard engineering. All the electrical machinery follows standard lines similar to that installed at St. Louis, the Pan-American and other expositions.

Those who have seen the plans of the Jamestown Exposition predict that the electrical features, particularly the illumination, will equal if not excel the display at the famous Pan-American Exposition. Thousands of Edison lamps will be supplemented by searchlights, both on land and on the fleets anchored in Hampton Roads, combining to make the nightly pageant magnificent and beautiful.

The Peruvian Government, according to a Lima, Peru, cablegram, has contracted with United States capitalists represented by Alfred MacCune for the construction of a railroad to the River Ucayali, which is one of the two large confluents of the Amazon. The existing Peruvian railroad from Lima runs eastward to Oroya, about 125 miles. The subvention for the construction of the proposed road is said to be \$10,000,000.

The Wadsworth Portable Core Oven.

It is the usual practice to bake foundry cores in brick ovens which occupy a relatively large space, and cannot be moved when more space or a change in the general arrangement is required. The desirability therefore of an economical and efficient portable core oven is obvious. Several types of ovens have been put on the market which are equipped with swinging doors. The objection to all ovens of this type is that there is a large amount of waste space, due to the difference between the area of the quadrant and the area of a square having sides equal to the radius of the quadrant. One objection to the quadrant or semi-circle type of oven is that it is not suitable for drying long cores such as are made in core machines, for the clearance which must be left along the curved edge of the shelf still further reduces the area that can be covered with core plates. The objection to all ovens of the stationary shelf type is that the core plates have

ciently utilized, there being no ducts or passages in which radiation takes place. In an experimental run the temperature was found to be 450 degrees in practically all parts of the oven, and this temperature was easily maintained the entire day on the amount of coke already referred to. The fact that the fronts of the doors drop down as shown enables the core plates to be taken out easily.

These ovens can be distributed about the core department, thus minimizing the distance the core makers have to walk to put their cores in the oven, and a rearrangement of the department can be effected very easily, as the portable oven is no more difficult to move than the core bench.

One point in this oven to which special attention should be called is the provision for supplementary shelves dividing the main drawers into divisions. As shown in the illustration, the two highest drawers are divided into three shelves each, the next into two and the bottom

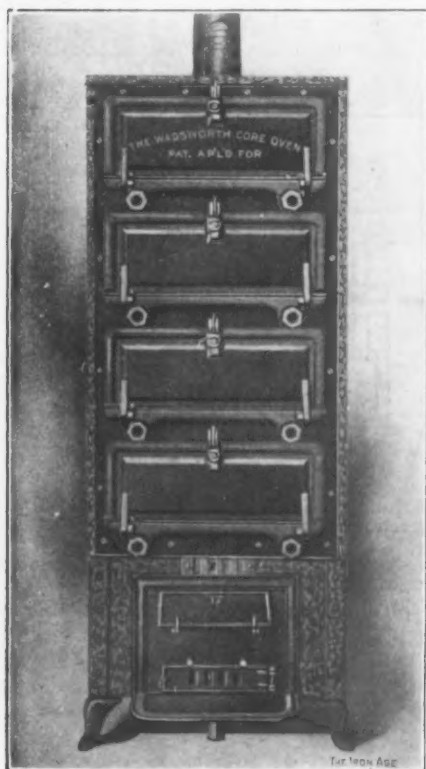


Fig. 1.—Front View, Closed.

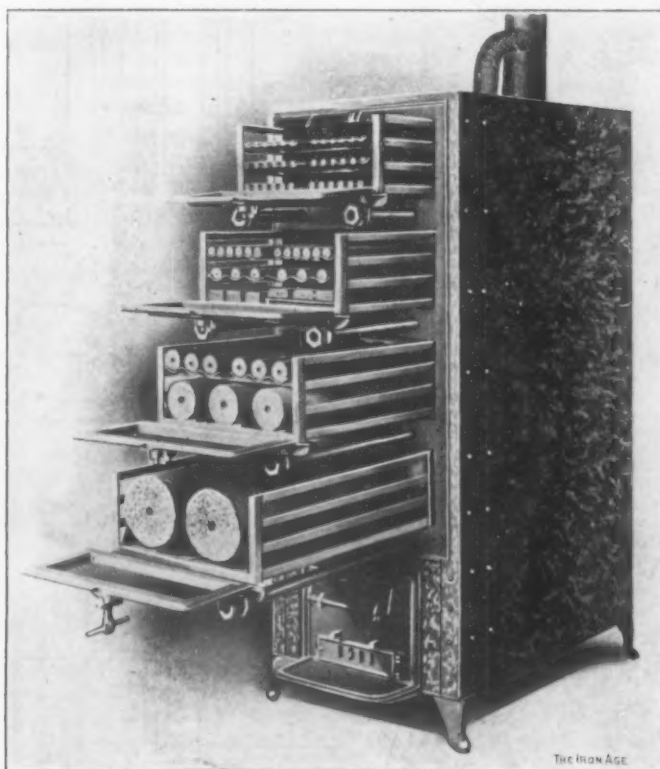


Fig. 2.—Perspective View, Open.

The Wadsworth Core Oven Made by the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio.

to be handled into and out of the oven through openings, which interfere with the heat or draft conditions and thus retard the baking of the cores in the oven.

The accompanying illustrations show two views of a self-contained drawer oven which was designed by George H. Wadsworth, and is manufactured by the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio. The one shown is equipped with four drawers, supported by rollers at the back and by pipe guides at the front. The drawers are removed from the oven by slipping a pair of handles into the pipes shown at the front, lifting them slightly and running them forward on the wheels on the inside at the back of the shelves, the action being much like that of a wheelbarrow. The shelves are self-sealing, in that when they are drawn forward a plate closes the opening, so that the baking of the cores on the other shelves goes on without interruption. Fig. 1 is a front view of the oven. In Fig. 2 the shelves are shown open and drawn to different distances, so as to illustrate the variety of cores which can be baked in the oven at one time. The large cores on the lower shelf are 7 in. in diameter.

The oven was run for an entire day on one bucketful of fine breeze, swept up in the coke bin. The consumption of coal in an oven of this kind would naturally be less than in other types, where the space is not so effi-

one is arranged without any supplementary shelves. The facility with which these different divisions can be put in will enable the operator to dry any size of cores readily.

That the natural color of pure water is blue, instead of white, was long ago discovered. The green and yellow tints are said to be due to extraneous substances. Dissolved calcium salts, though apparently giving a greenish tint, due to a fine invisible suspension, have no effect on the color of the water when precautions are taken to prevent it. The brown or yellow color due to iron salts is not seen when calcium is present. The green tint is often due to a condition of equilibrium between the color effect of the iron salts and the precipitating action of the calcium salts.

The Pittsburgh Coal Company, Pittsburgh, will shortly let contracts for the building of 350 more coke ovens at its Grindstone plant in the Lower Connellsville region. It is now building 250 ovens at this plant, which will be known as Grindstone Works No. 1, while the additional plant of 350 ovens will be known as Grindstone Works No. 2. It is predicted that within a few years the Pittsburgh Coal Company will be one of the largest coke producers in the country.

A Feeding Device for Rolling Mills.

Edwin E. Slick, consulting engineer for the Carnegie Steel Company, Pittsburgh, has designed a rolling mill feeding device on which a patent has recently been issued. The invention is applicable to mills employed for reducing ingots, blooms, slabs, etc., to finished materials, and in which it is required to turn the piece from a flat to an edgewise position before entering the rolls for certain passes. The plan in brief is to mount the housings for the pinch rolls and the guides in such a manner that they may move bodily from their horizontal receiving

gear *k*. The shaft *l* also carries a bevel gear wheel, *o*, which meshes with a similar wheel on the shaft *h*, this in turn meshing with a third bevel gear wheel through which motion is communicated to the lower pinch roll. The rock shaft *h* is actuated by means of hydraulic cylinders, *r*, through the links *p*, connecting to the arm *s* of the shaft. The slabbing and edging passes of the mill are shown at *m* and *n* respectively. The journal *t* of the upper pinchroll is movable in guides of the housing *d* and the journal is connected by links *v* with the pivoted stop levers *x* adapted to engage a stop, *w*.

When the piece entering the guides *b* from the re-

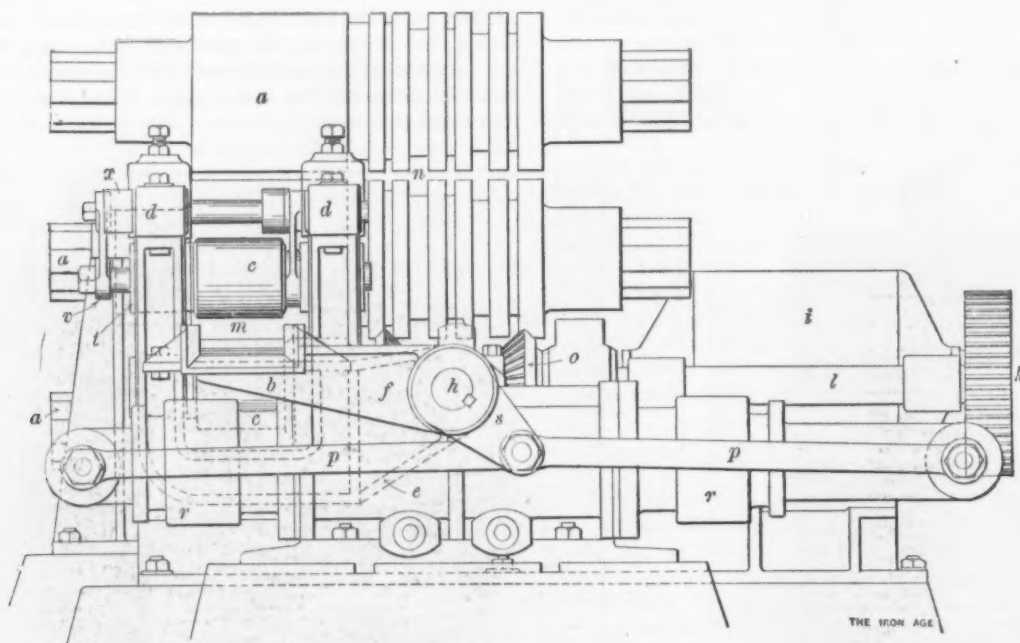


Fig. 1.—Feeding Device for Rolling Mills.—Pinch Rolls in Receiving Position.

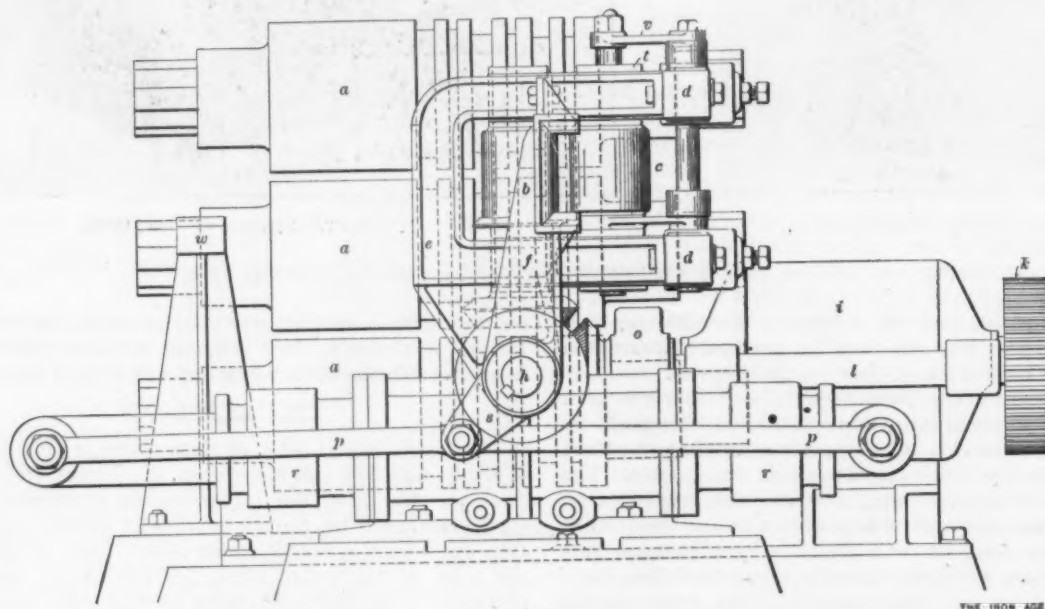


Fig. 2.—Pinch Rolls Raised and in Position to Introduce the Piece for Edging Pass.

positions to a vertical position in which the pinch rolls are in line with an edging pass in the reducing rolls.

Of the illustrations Fig. 1 is a front elevation showing the pinch rolls and their adjuncts in their receiving positions. Fig. 2 is also a front elevation but with the pinch rolls raised to bring them into line with the edging passes of the rolls. From the reducing rolls, *a*, the bar passes to the guides *b* and pinch rolls *c*. The pinch rolls are journaled in the housings *d*, carried by arms, *e*, which, together with the arms *f* supporting the guides, are secured to a rock shaft, *h*. The pinch rolls are driven by the motor *i*, which actuates the shaft *l* through the

reducing roll pass *m* passes through the pinch rolls it is lifted into proper relation to the edging pass *n* by actuating the rock shaft *h* to raise the pinch rolls and guide into a vertical position, as in Fig. 2. The arrangement of the gearing for actuating the pinch rolls is with a view to such movement of the rolls into the vertical position and also permits either movement to be reversed. When the pinch rolls and guides are lowered to the horizontal position to receive a new bar the lever *x* engages the stop *w* and raises the upper pinch roll in the guide of its housing *d* sufficiently to spread the two rolls to receive another bar. As the pinch rolls are again lifted to

the position shown in Fig. 2 the upper roll is closed to pinch the bar. The entry of the bar to these rolls is thus greatly facilitated and buckling of the steel is prevented.

The device makes it possible to roll and edge material at the same time without changing rolls. It has been installed at the Twenty-ninth Street or Lower Union Mills of the Carnegie Steel Company, Pittsburgh, and has worked quite satisfactorily.

Mexican Railroad and Business Notes.

DURANGO, April 10, 1907.—The Mexican Congress re-assembled on the evening of April 1. The address of President Diaz to the Senators and Deputies was characterized by the note of optimism which has become usual of late years, the only jarring chord in the paeon laudatory of financial prosperity and industrial progress vibrating upon the recent disputes between capital and labor, which resulted in riot and blood letting. The President reiterates his determination to compel respect for the law.

He notes with satisfaction the continued prosperity of the mining industry, and records the fact that in the periods from June to December of last year "2000 title deeds for mining properties were made out, embracing an area of 30,649 hectares."

Advancement in the mechanical arts and the expanding field for the utilization of the people's energies have naturally given a stimulus to inventive genius, a fact made evident by the increasing business of the Mexican Patent Office. In the first half of the current fiscal year 585 patents were granted and 475 trademarks and 44 commercial names and announcements were registered.

The very general use of the waters of the country, both for the purpose of irrigation and for the generation of electrical power, is remarked in the message.

Referring to progress in railroad building, the President says: "Since September last the additions to the railroads subject to Federal jurisdiction have been a little more than 200 kilometers, and the present length of the system is 17,647 kilometers, which added to the 4259 kilometers of lines constructed under State concessions give a total of 21,906 kilometers."

Reference is also made to the recent acquisition by the Government of a controlling interest in the Mexican Central, the President expressing regret that "it has not yet been possible to arrive at a definite result in this affair, owing to the unsettled state of foreign markets and the necessity of studying carefully the legal form in which the arrangements will have to be carried out."

The financial position of the Government continues prosperous. Custom house collections have increased and "the currency situation has greatly improved." The President notes the encouraging fact that "as against \$43,000,000 of gold that had been coined on September 16 last, the coinage of gold has now reached almost \$60,000,000 in pieces of 5 and 10 pesos."

Railroad Concessions and Construction.

A good deal of local enthusiasm was aroused at the Pacific port of Mazatlan a few days ago by the beginning of work upon the Southern Pacific Railway Company's extension from that point north to the port of Gudymas, Sonora, and south to the city of Guadalajara, in the State of Jalisco. Elaborate ceremonies marked the inauguration of actual construction work. Operations will also shortly be commenced at the last named point, and the entire line will, it is expected, be completed in three years' time.

Much material is being received at Manzanillo for the Mexican Central's extension now in course of construction. Track laying is in progress south of Tuxpan.

Richard Honey, a gentleman well known in Mexico in many lines of industrial activity, is reported as having commenced work on a new railroad which is to be known as the Pachuca, Zimapan & Tampico. Mr. Honey holds a concession from the Federal Government and also from the State government of Hidalgo, the latter carrying a subsidy. A portion of the line has already been located. The proposed route is from the mining camp of Pachuca, which is also the capital of Hidalgo, through the mining territory of Actopan, Cardonal, Bonanza and Zimapan,

and from that point through to the Gulf coast at Tampico.

Good progress is reported upon the construction of the Cananea, Yaqui River & Pacific, a branch line of the Southern Pacific Railway Company. It is estimated that 400 kilometers will be laid by the end of the year. The State government of Chihuahua has given a concession to John L. Johnson for the construction of a standard gauge line from Cerro de los Lamentos to the station of Ojo Caliente, on the Mexican Central, a year being allowed for the completion of the work.

Industrial Notes.

A concern named Compañia Nacional Explotadora de Carbon y Coke, capitalized at \$1,000,000, has been organized in the City of Mexico to develop certain coal bodies on the San Blas hacienda in the State of Coahuila. The officers of the company are: Fernando Pimentel y Fagoaga, president; Gustavo Block, Jacinto Pimentel, Angel Lopez Negrete, Arturo Braniff, Javier Icaza y Landa, Luis Barroso Arias, J. Silcdo y Aviles, F. Asunsolo and Diego Redo.

An extensive system of irrigation, involving the construction of reservoirs and distributing ditches, is to be undertaken by certain land owners near Taso del Zacate, in the State of Nuevo Leon. Señor Isaac Garza is interested in the enterprise, and may be in the market for pumps and piping.

An item appeared in the local press a few days ago to the effect that "one of the largest shipments of steel yet received in Mexico" was in course of transit from Vera Cruz to the City of Mexico. It comprised 29 cars of structural material to be used in building a new public edifice.

J. J. D.

A New Engineering Building at Swarthmore.

The new engineering shop building, at Swarthmore College, Swarthmore, Pa., is completed and ready for use. The building is three stories in height. The architectural design is simple and effective, and harmonizes well with the building adjacent to it. The walls are constructed of hollow concrete blocks, and the second and third floors are of reinforced concrete carried on concrete beams and columns designed to carry a live load of 150 lb. to the square foot. The stairs and landings throughout are of reinforced concrete with metal railings and guards.

On the first floor there are two testing rooms, vault for records, a locker and 3300 sq. ft. of space which will be occupied by the forge and foundry.

The second floor will be used for iron and machine shops, besides several rooms for offices and two lecture rooms. The third floor will be equipped for pattern making and woodworking. The building is covered with a slag roof, and with the exception of this roof it will be entirely fireproof.

The heating will be steam radiation, operated by the Webster vacuum system, and the lighting will be done entirely with electric lamps and reflecting arcs. The elevator and machinery in the various shops will be operated only with electric motors; and long lines of countershafting will be avoided by grouping the machinery on separate motor drives.

At the annual election held by the new Board of Directors of the Cleveland, Ohio, Chamber of Commerce, held on April 11, Lyman H. Treadway, assistant manager of the Peck, Stow & Wilcox Company, was elected president to succeed F. F. Prentiss, president of the Cleveland Twist Drill Company, who has been at the head of the chamber for the past year. Harry Coulby, president and general manager of the Pittsburgh Steamship Company, was elected first vice-president.

Milliken Brothers, Incorporated, 11 Broadway, New York, report their new structural mills on Staten Island turning out a steadily increasing product. A new record was made by rolling 356 gross tons of steel beams on single turn on April 12.

A New Besly Spiral Disk Grinder.

The latest addition to the line of spiral disk grinders manufactured by Charles H. Besly & Co., Chicago, Ill., is the No. 14 size herewith illustrated. It is regularly equipped with 20-in. disks, but as a maximum will swing 23 in. In general it is very solidly built to satisfactorily handle the severest work of this character which it might be called upon to perform.

There are certain improvements and changes in this machine from those formerly manufactured. The general appearance is somewhat different, the design of the frame being slightly changed; but what is more important, the table guiding and controlling features have been improved. Both tables are made to rock in front of the grinding wheels, and are adjustably counter-weighted to retain normally a vertical position. Heretofore the left hand table has been made to clamp only. It is now provided equipped with a detachable bevel gauge graduated to 45 degrees. The right hand table has in addition to the rocking motion about the horizontal

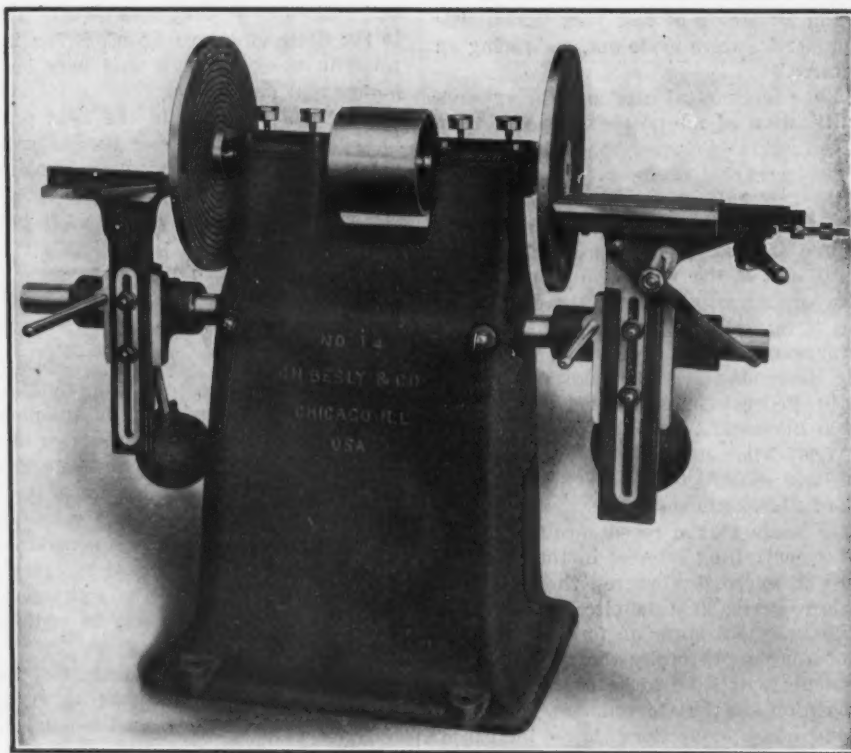
contact with the work is corrugated in such a manner as to have an effect in grinding that corresponds to a shearing cut. The end thrust of the spindle is taken on large hardened and ground steel collars, situated between the driving pulley and the flanges of the bronze bushings in the spindle bearings.

The machine occupies a floor space of about 5 x 10 ft., and weighs in the neighborhood of 3000 lb. The right hand lever feed table has a top area 10 x 12 in. Both tables have vertical adjustment and a rocking motion, and are dustproof. When desired either table may be clamped to the rocker shaft and used as a stationary table.

Railroad Shortcomings in Germany.

To American manufacturers the following from a German trade journal has a strangely familiar sound, and it looks as though state control does not lead to much better results than the despised handling of business by railroad magnates:

"In consequence of the heavy pressure upon the iron



The New No. 14 Spiral Disk Grinder Built by Charles H. Besly & Co., Chicago.

axis a tilting adjustment in a vertical plane, so that the faces of parts to be ground may be finished at other than right angles with the surface upon which they rest. The right hand table is provided with slots and a keyway for attaching angle plates or other work holders. It is arranged to feed perpendicularly to the wheel by the manipulation of the hand lever shown. There is also a micrometer stop screw on this table, graduated to read to one-thousandths of an inch, which makes it possible to grind a definite amount from the surface of the work.

The design of the machine as a whole shows the principal consideration to have been a large producing capacity, and to that end the handling of work in duplicate has been made as easy and rapid as possible. The table is mounted on a gibbed dovetailed slide, and is movable to and from the grinding disk by a lever, pinion and rack, giving a leverage of 14 to 1. Through this mechanism, with comparatively little exertion, the operator may exert a pressure of the work against the abrading disk that realizes the maximum efficiency in the grinding, making it possible to accomplish a large amount of work in a given time.

The disk wheels, as before stated, are 20 in. in diameter, and are about 13-16 in. thick. They are spirally grooved, so that the attached sheet of emery paper in

industry, created suddenly by the enormous railroad movement, and the inadequate transportation facilities of the Prussian state railroads, it has been impossible for many works to accept foreign orders. At times the orders and specifications of the home roads were so heavy that the German car shops and locomotive works were forced to strain their resources in order to keep to the short deliveries demanded by an unprecedented scarcity of cars and locomotives. Even now the shops are supplied with orders for a long time. But whether the rolling stock ordered will suffice is doubtful. The following is a startling fact: On account of scarcity of cars the production of coal declined by 2,000,000 tons during this winter. This means a falling off in business to the collieries of 20,000,000 marks and to the miners a loss of wages of from 5,000,000 to 6,000,000 marks. The principal blame for these saddening conditions lies with the Government railroad management."

It is stated that the Hopewell iron ore mines in Chester County, Pennsylvania, which have been idle for about 20 years, have been leased by a syndicate headed by Henry D. Saylor of Pottstown, Pa., and that the tract of 168 acres will be developed. A large amount of ore is said to be in sight.

The Pennsylvania's All-Steel Mail Car.

The nearest approach to a truly all-steel railroad car is mail car No. 6546, recently built to operate on the Pennsylvania lines. With the exception of 370 lb. of wood, 2840 lb. of fireproof composite and asbestos board, 3200

The strongest and best equipped car heretofore was that known as the "Universal Postal Car," which has an inside length of 60 ft., is of wood construction, with reinforced ends containing 10-in. I-beams placed vertically at each side of the doorways; is lighted with Pintsch gas lamps and weighs 110,000 lb. The 70-ft. steel car has

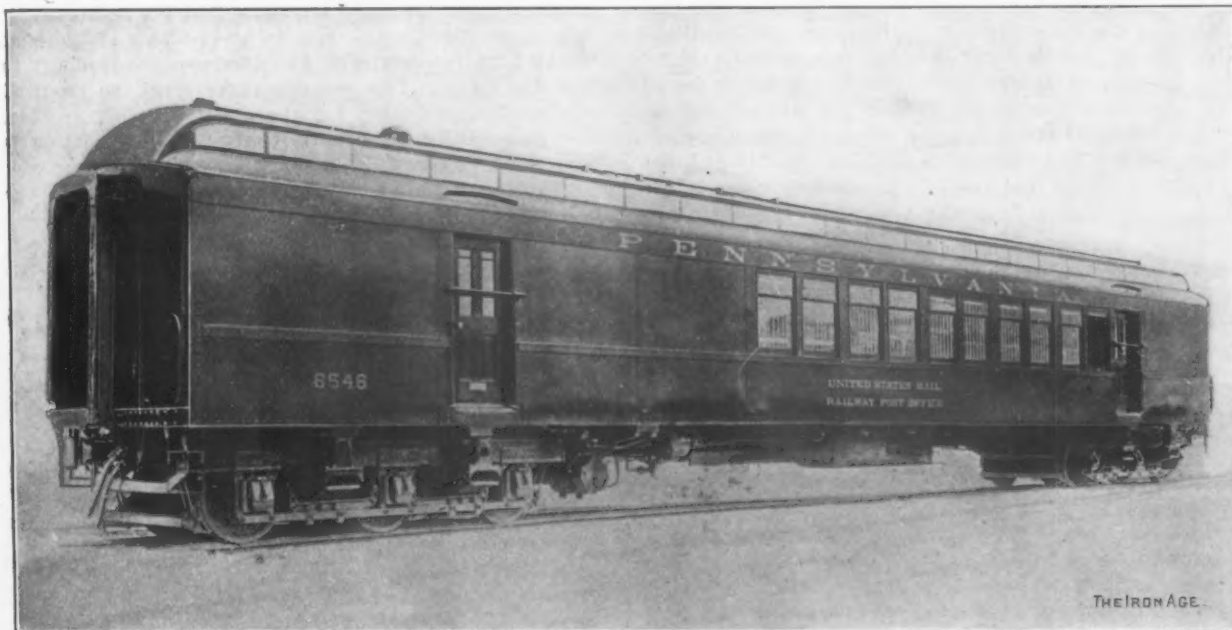


Fig. 1.—The New All-Steel Mail Car No. 6546.

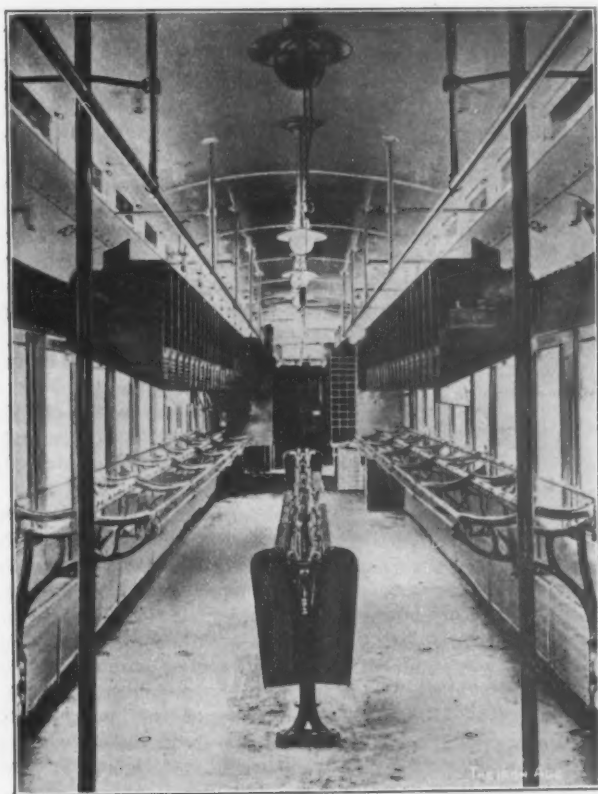


Fig. 2.—Interior of the All-Steel Mail Car.

lb. of cement flooring and a very small amount of rubber, everything is metal, including paper cases, letter cases, paper boxes and doors. This car, shown in Fig. 1, is 10 ft. longer than postal cars built heretofore, and has an entirely new interior arrangement, which may be seen in Fig. 2. It includes storage space at each end of the car, eliminating the necessity for turning the car end for end at terminals. The maximum outside dimensions are 74 ft. 9 $\frac{3}{4}$ in. length over buffers, 9 ft. 11 $\frac{1}{2}$ in. width over roof eaves and 14 ft. 5 in. height from top of rail to top of junction box on roof. The inside length is 70 ft. 8 $\frac{3}{4}$ in. and inside width 9 ft. $\frac{5}{8}$ in.

12-in. I-beams placed vertically at each side of the doorways, is lighted by electric lamps, in conjunction with storage batteries and an axle light generator, and weighs 128,500 lb.

The trucks and body framing incorporate all the features which were found satisfactory in the steel passenger car. The trucks are of the six-wheel type, having a framing entirely of steel, and are of sufficient strength for use under cars having a total loaded weight of 190,000 lb. A special flexible spring rigging, combined with the use of four side bearings per truck, imparts exceptionally easy riding qualities to this truck. The axles are of large diameter, and the wheels are made of rolled steel.

The body framing includes a heavy central box girder, built up of two 18-in. I-beams and two $\frac{1}{2}$ x 24 in. cover plates, and side girders 36 in. deep, having a strong bottom flange of large area, which also forms the belt rail. A 12-in. I-beam is placed on each side of each end door, riveted at the bottom to a steel center sill end casting and at the top to a cross beam of channel section. The cross beam distributes to the roof construction and side plates the strains, which may come on the vertical I-beams in time of collision. This strong end framing, combined with the peculiarly heavy longitudinal girders in the underframe, offers greater resistance to end shock than ever before attempted.

The flooring consists of a cement, which is spread over corrugated iron foundation plates in a plastic state. The outside sheathing, including the roof, is made of steel plate. The inside of the car, where not covered with furniture peculiar to postal cars, is lined with fireproof composite board. All inside lining plates are covered with an asbestos cloth glued to the sheets, to reduce the sound and heat conducting properties. The wires and storage battery boxes for the electric lighting have been carefully insulated. The steam heat and brake arrangements are of the latest and most improved types, and the draft gear is of the same flexible, strong pattern which has given excellent service on the steel passenger car.

The furniture in the car is in conformity with the requirements of the Railway Mail Service Department, but is made of steel instead of wood. The only danger from fire will come from the inflammable nature of the mails, and fire extinguishers are provided to guard against that.

New National Portable and Stationary Air Compressors.

The increasing use of compressed air in manufacturing and power plants, car barns, &c., has given quite an impetus to the manufacture of electrically driven air compressors which are self-contained and conveniently taken to the place where the compressed air is utilized. In drilling, riveting and chipping compressed air tools can be more advantageously employed than purely manual or mechanically operated devices. In electric railroad car barns or at steam railroad terminals compressed air is convenient and effectual in cleaning out dirt and dust. In power houses and substations it offers many advan-

29 $\frac{1}{4}$ in. wide over all, which permits it to be taken readily through doors and narrow or crowded spaces in shops and factories. One of the distinctive features in the air compressor furnished with the portable outfit is the construction of the motor and compressor as entirely separate and self-contained units. When the two parts are assembled a compact and rigid unit is produced. The crank chamber cover and the motor base are separated by a $\frac{1}{2}$ -in. air space, which acts as an insulator of the heat radiated by the compressor and decreases the tendency to heat the motor. This separate cover gives the required bracing and stiffening for the crank chamber casting. The accessibility of all parts likely to need attention is illustrated in Fig. 2.

The crank shaft is fitted with a third bearing in the

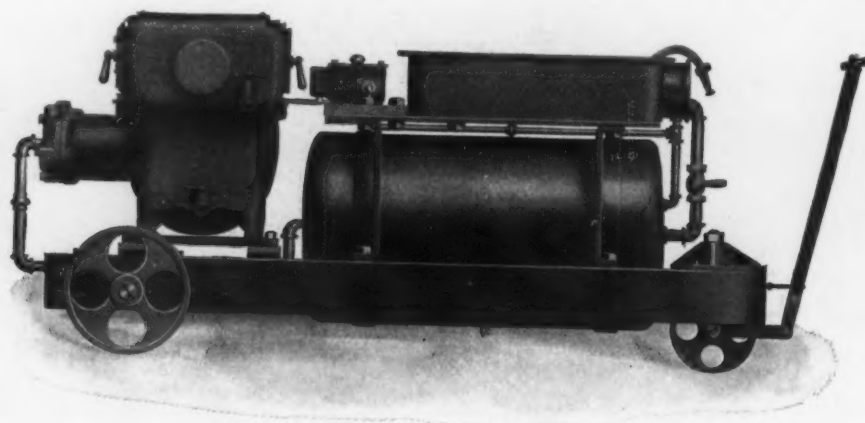


Fig. 1.—Portable Motor Driven Air Compressor Built by the National Brake & Electric Company, Milwaukee, Wis.

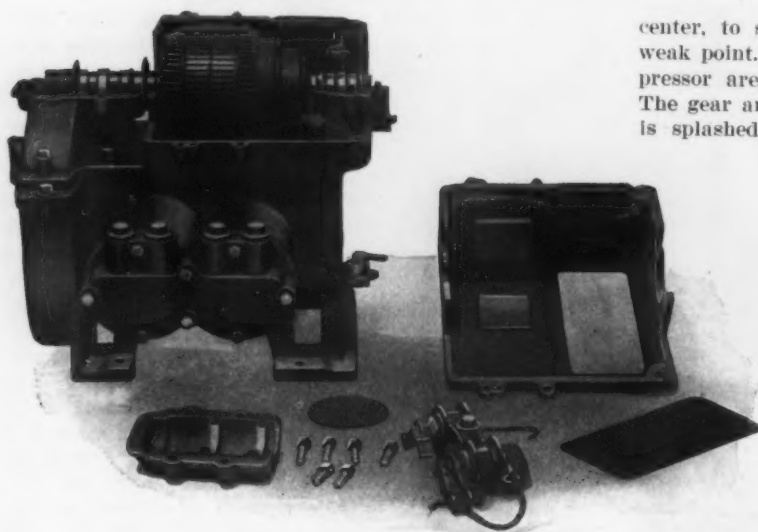


Fig. 2.—The Motor and Compressor Partly Unassembled.

tages in blowing out dust from generator coils, field magnets and commutators. In automobile garages it is especially useful for inflating tires, cleaning dust from cushions, running gear, &c. The simplicity, flexibility, cleanliness and reliability of air as a source of power for a great many different purposes is coming to be better recognized.

A demand exists for a compact, self-contained and stoutly constructed portable compressor outfit, which the National Brake & Electric Company, Milwaukee, Wis., has sought to supply in the type illustrated in Fig. 1. The outfit comprises a compressor, an automatic type H governor and necessary piping, an air gauge and reservoirs, and a combined switch and fuse, the whole being mounted on a substantial angle iron frame supported on wheels. The front wheel is hung in a pivoted fork made of cast steel, the outfit being drawn around by a wrought iron tongue.

One of the greatest advantages in the new design of the National portable air compressor is the exceptionally small width of the outfit, which is gained by disposing the parts without waste of space on the truck. It is only

center, to support and strengthen it at this otherwise weak point. All bearing and working parts of the compressor are lubricated by the splash system of oiling. The gear and crank are inclosed in a bath of oil, which is splashed over all the operating parts of the compressor.

The valve head is constructed with the discharge valve toward the center and the suction valve toward the outside of the head. The discharge pipe runs straight out from the valve head to the main reservoir, thus dispensing with the necessity of attaching elbows. The suction has two openings, one on each side of the valve head; either or both can be used.

A standard National four-pole inclosed motor is used, the frame of which is cast steel in two parts, forming a box shaped covering for the armature and field coils. The pole pieces are integral with the frame. The standard type N oil pneumatic governor, with cover removed, is shown in Fig. 3. The governor is extremely simple in design, has few working parts and occupies very little space. The essential features of the device are a cylinder $1\frac{1}{4}$ in. in diameter, which is connected direct to the main reservoir; a piston working in the cylinder is acted upon on one side by the pressure of the air in the main reservoir and on the other by the expansion of the operating spring. Movement of the piston throws a toggle joint over its center and causes a hammer to strike a switch arm, which makes or breaks the circuit to the air pump. The working parts are all contained in a box filled with oil, which not only serves to keep the working parts lubricated, but also extinguishes the arc caused by breaking the circuit. A tightly fitting cover prevents leakage of oil.

With the portable outfit there is also furnished a safety valve, an air gauge, piping and a hose container large enough to hold from 75 to 100 ft. of hose.

Type L Water Jacketed Stationary Compressors.

These compressors are identical in every respect with the compressors just described, except that provision is made for a circulation of water around the cylinders and heads, keeping these parts at a minimum temperature

and permitting the machines to be operated continuously. All working parts of the compressor operate in a bath of oil. The other parts are automatically continuously and thoroughly lubricated.

With the water jacketed types there is furnished a water governor which automatically cuts off the circulation of water as soon as the compressor is shut down, and admits it to the cylinders and heads when the compressor is started up. Although the working parts of the machine are entirely inclosed and protected from injury, accessibility was carefully considered in the design and every part can be quickly and easily inspected.

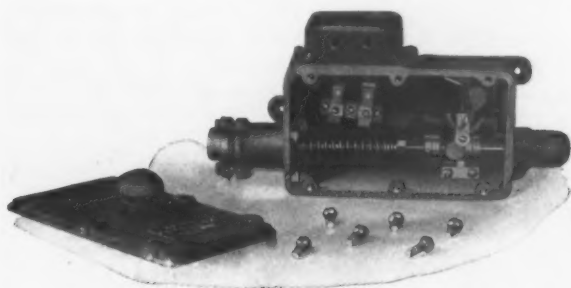


Fig. 3.—The Governor with Cover Removed.

The portable compressor outfits are made in capacities of from 11 to 50 cu. ft. of free air per minute, and the water jacketed types from 12 to 35 cu. ft. of free air per minute.

San Francisco Trade Topics.

SAN FRANCISCO, April 8, 1907.—Largely on account of the weather business for the greater part of the month of March was quiet and sales in all lines of merchandise fell off. It was practically impossible most of the time to transport goods through San Francisco streets on account of the mud, so that supplies of lumber and hardware could only with difficulty be brought to the buildings in course of erection, and where these buildings were not closed in no work could be carried on at all. Of course this inconvenience has been only temporary, but it has been felt by the retailers. Indeed from the first of the year the weather has been so rainy that it has interfered with business in every line, and although owing to the peculiar circumstances of the city it cannot be said that less goods have been sold than for the same time in 1906, still there has been a falling off in demand causing much disappointment to the trade.

Of course all the supplies that would have been bought will be needed later and the total for the year may not fall behind that of 1906—indeed, it promises to exceed it considerably. Great activity has set in during the past three or four days in the building trade, and retail sales of hardware have started up again with great briskness. Crops of all kinds promise well. There will be a good crop of barley, a medium one of wheat and the fruit crop will be large. The lumber business will exceed all precedent. The oil fields will show a large increase of production. Copper will also do well. The produce of California in 1907 will sell for a big price, and there will be a prosperous year in every line of business.

In common with many other lines the iron and steel trade will suffer at least temporary inconvenience by the withdrawal of the vessels of the Oceanic Steamship Company, which for many years have been making monthly trips between San Francisco, Honolulu, Auckland, Sydney and some intervening ports. The values of the cargoes carried varied from about \$220,000 to \$300,000 per trip. Outside of purely California goods the cargoes consisted principally of Eastern manufactures, including large quantities of machinery, iron pipe, automobiles, wire electrical goods, agricultural machinery, hardware, &c. A great deal of the machinery, mining machinery in particular, has been of San Francisco manufacture. In regard to this latter, there were in past

days many complaints of irregular delivery, and this was calculated to injure the San Francisco trade, as well as the steamers. In late years a good deal of San Francisco made mining machinery has been shipped to the mines at Coolgardie in Western Australia. A great many gasoline engines have also been shipped to Australia and New Zealand. As a rule, too, agricultural machinery shipped to the Antipodes has been of California manufacture. More or less fine cutlery, for which San Francisco has long been noted, has gone to Australia on the vessels of this line. Some of this trade will probably be lost unless the steamer line can be restored in a reasonable time. Our merchants, without regard to political faith, consider the failure of this line a great calamity, and believe that Congress failed in its duty to American commercial interests when it refused to vote the law granting additional subsidy to the American commercial marine. California has sometimes voted one way and sometimes another, but if at any time the question of subsidy or no subsidy had been squarely submitted to our people subsidy would have carried by an overwhelming majority.

J. O. L.

Phosphorus Additions to Bronze.

Calling attention to the danger of too large a phosphorus addition in making phosphor-bronze, the *Brass World* points out that an excess will produce pin holes, though the object of the phosphorus is to prevent them. Since the phosphorus is introduced in the form of phosphor-tin, the maximum permissible quantity is thus indicated for the various classes of product:

For rolling (no zinc):	Per cent.
Phosphorus	0.05
Or, 5 per cent. phosphor-tin.....	1.00
For sand casting (no zinc):	
Phosphorus	0.25
Or, 5 per cent. phosphor-tin.....	5.00
For gun metal, composition or yellow brass:	
Phosphorus	0.01
Or, 5 per cent. phosphor-tin.....	0.20

It is stated that the principal error is in too large additions to mixtures containing zinc, many of the formulas given for this class of work being incorrect. "If too much phosphorus, or its equivalent, phosphor-tin, is added to composition, gun metal, yellow brass or other alloys containing zinc, pin holes will surely follow. By adding an ounce or two of 5 per cent. phosphor-tin to 100 lb. of yellow brass, but not over, it will prevent pin holes in the casting. If the amount is exceeded, however, the pin holes will be present in even greater numbers than without any phosphorus at all."

The Union Horseshoe Company, Providence, R. I., has been incorporated with a capital stock of \$100,000. The president is Richard Roscoe, a manufacturing chemist of Pawtucket, R. I., while Olney T. Inman, a woolen manufacturer of Burrillville, R. I., is secretary and treasurer. The Board of Directors comprises the above named, together with Henry J. Bailey of Pawtucket, James H. Taylor of Pawtucket, and Josiah King of Warwick, R. I. It is the intention of the company to equip a plant with a horseshoe machine invented by Mr. Taylor, who for 15 years was in the employ of the Rhode Island Perkins Horseshoe Company. The machine, which operates on the rotary principle, is said to be capable of turning out perfect shoes with a single handling of the bar, taking the bar directly from a rolling mill, cutting it the required length and running it while still at red heat between dies, working against each other on circular beds, which punch the holes and fashion the style of shoe. The statement is made that shoes with calks, toe and side weights, and in fact, every kind of a shoe now made by machine or by hand can be turned out, simply by changing the dies, at the rate of 15 to 60 shoes a minute for each machine. The company will build its own machines as well as manufacture the shoes.

A report just compiled by the Pittsburgh Chamber of Commerce states that \$350,000,000 is paid annually to the wage earners of the Pittsburgh District.

The Redin-Eckstrom Belt and Roller Sander.

With but little variation in the method of use and manner of arrangement sanding belts and roller sanders form a part of the equipment of most woodworking shops. The combination belt and roller sander shown in the accompanying illustrations is peculiarly well adapted to pattern shops, as it combines in one machine the necessary equipment for operations requiring the use of both belt and roller, and is also fitted with an ingenious adjustment to facilitate handling various shaped pieces. It is manufactured by Redin, Eckstrom & Co., Rockford, Ill., makers of tools, special machines and gasoline engines.

The machine is entirely self-contained, as may be seen in Fig. 1. The drive is communicated to what is substantially a countershaft supported by a bracket at

to run the sanding belt vertically before a removable work table. This adjustment is suitable for handling square shapes and those with perpendicular surfaces. By moving the idler backward, as shown in Fig. 2, the belt is pitched to an angle well adapted for finishing flat surfaces on long pieces. A wooden pad placed under the working surface of the belt furnishes the necessary support at this point and is held in position by simple fastenings. Similarly the idler may be swung forward, and with the use of smaller diameter rollers concave surfaces of varying curvatures are conveniently handled. This adjustment is especially well suited to the finishing of furniture shapes and moldings.

Dust is caught and withdrawn by two collectors attached to the machine. The one in front, H, moves with the roller head, when the latter is shifted along the bed to accommodate different adjustments of the sanding belt, and it may also be lowered to give sufficient clearance when work is being done over the lower roller.

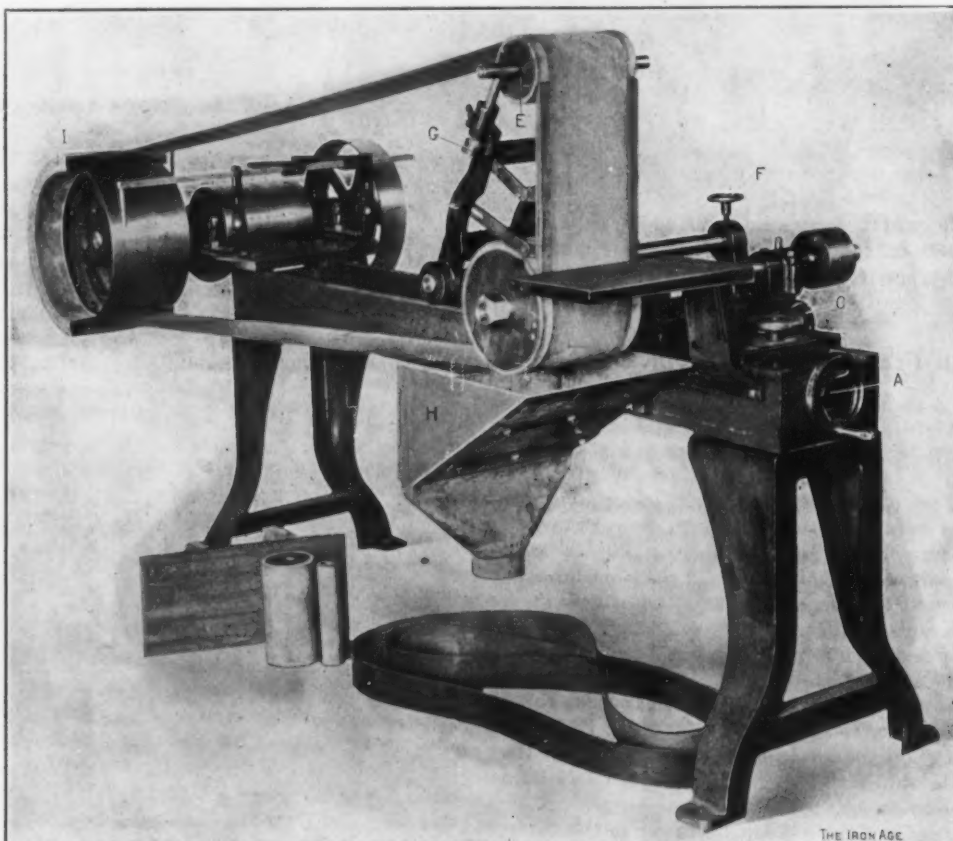


Fig. 1.—The No. 1 Combination Belt and Roller Sander Made by Redin, Eckstrom & Co., Rockford, Ill.

one end of the bed, and the driving belt may connect to a line shaft either above or below. The roller head is adjustable along the length of the bed on planed ways by a hand wheel, A, and screw at the front end, as seen in all of the illustrations. To secure straight travel of belts the roller head swings laterally on a pivot, B, Figs. 2 and 3, this movement being regulated by a hand wheel, screw, C, and when properly adjusted the head is locked by a clamp nut, D, Fig. 3. This can be safely done while the machine is in motion.

By manipulating an adjustable idler, E, the working surface of the sand belt is made to travel at any angle to accommodate the different shapes of pieces to be finished. The idler bracket is detachable, and when not in use may be removed from the machine. An oiling device is used to lubricate the bearings of the idler roller, which, it is claimed, effectually prevents oil from coming in contact with the sand belt. By oil holes drilled through the shanks supporting the bearings of the roller the lubricant is forced upward to the journals by compression grease cups, G, fitted to the lower ends of the shanks, and the use of oil cups on top of the bearings in close proximity to the belt is thus obviated.

Fig. 1 shows the machine with the idler set in position

The semicircular dust box I in the rear is designed to catch the dust carried around by the sanding belt. It is fitted over the back half of the sand belt driving pulley and is made in two parts, easily detachable for convenience in removing the sand belt, being held in place by iron straps attached to the shaft bracket.

The loosening of the two hand screws F and J, Fig. 2, permits the removal of the idler and sanding belt, and with the leather driving belt placed over the right hand pulleys of the roller and driving shafts the machine is ready for use as a sander roller, as shown in Fig. 3. Various sized rollers convenient for sanding frames and work of similar character, for which the belt cannot be used, may be fitted to the roller shaft, and for such work sandpaper is glued to the roller and the sanding belt dispensed with.

Pneumatic rollers for both idler and main roller shafts are also furnished when desired. These, when inflated, form soft barrel shaped cushions that are described as advantageous in finishing half round and curved work difficult to sand by the ordinary methods. It is claimed that with ordinary care the sand belt will travel over the inflated idler roller without a friction covering, but a sandpaper sleeve slipped on over the

main roller is usually necessary. The wooden rollers are made of seasoned maple strips, glued together, turned and covered with felt.

The machine as a whole is strongly constructed, all large bearings are babitted and the idler bearings are bronze. The bed is 6 ft. long and stands 54 in. high over all when adjusted, as shown in Fig. 1. The tight and loose driven pulleys are 4 x 10 in.; the sand belt pulley, 8 x 16 in.; driving pulley for roller, 3 x 15 in., and

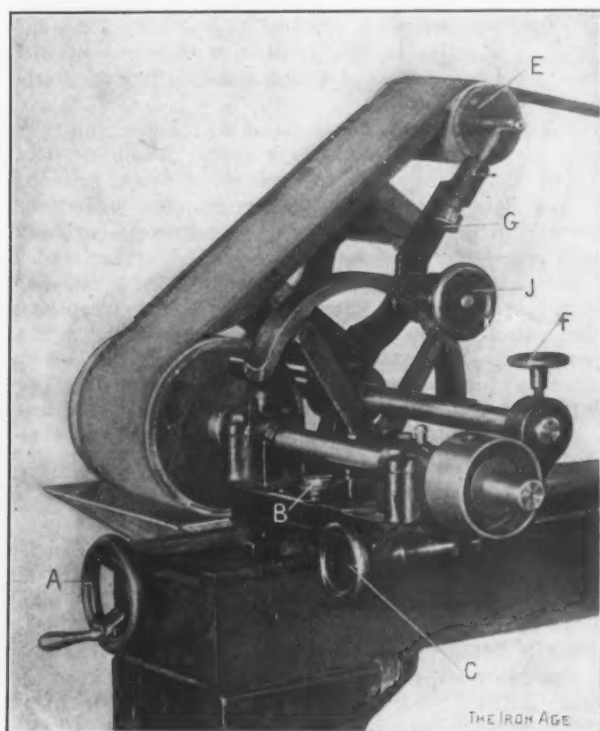


Fig. 2.—Detail of the Head Showing a Different Adjustment of the Rollers.

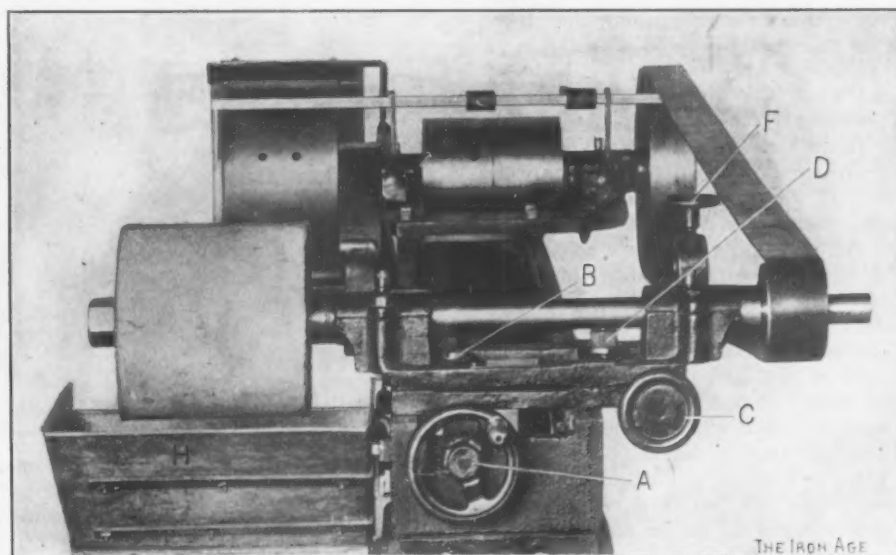


Fig. 3.—The Idler and Belt Removed and the Machine Arranged as a Roller Sander.

roller spindle pulley, 3 x 4 in. Because of its adaptability to different shapes, curves and corners, this machine should render efficient service in pattern making shops, as well as in general woodworking plants.

At a recent annual meeting of Hadfield's Steel Foundry Company, Sheffield, England, a dividend of 25 per cent. was declared. The president, R. A. Hadfield, said that the company had brought out a new product known as "Era" steel, which has been adopted by the British Government for a number of war vessels. A new type of projectile, "Eron," has also been brought out, and the Government is giving it a thorough test.

Useful Machine Shop Information.

To those interested the Cleveland Twist Drill Company, Cleveland, Ohio, is distributing a set of ready reference cards, which should be of considerable value in the machine shop or store. The cards, five in number, are each 6 x 9½ in. in size, of heavy board, rounded corners and printed on both sides, each being eyeletted at the center of the top, and the set bound together with a brass ring. The cover card carries an illustration of the company's works, and a statement of the tools it manufactures. The reverse side of this card gives detail dimensions of regular tapers for sockets and shanks for drills and reamers. One side of the second card gives dimensions of taper shanks, and the other a table of cutting speeds suitable when using carbon steel drills. The next card on one side gives parts of an inch in decimals for use with micrometer calipers, and the reverse side contains a drill list for taps with V threads, giving diameter of tap, threads per inch and size of drill. On the fourth card is printed a similar drill list for taps with U. S. standard threads, and for machine screw taps, and a table of bolt and nut dimensions constituting the U. S. standard system, and a drill list for pipe taps. The fifth card contains hints on the use of high speed steel drills, and suggestions for the regrinding of drills, illustrated with a model point intended to serve as a guide for the proper regrinding of drills.

The hints on the use of high speed steel drills are of such value that we take the liberty of reprinting them. They are as follows:

"The successful use of high speed steel drills depends more upon the conditions under which they are operated than upon the tools themselves, providing they are properly made. From exhaustive tests and close observation we have concluded that for practical purposes it is always well to start a drill with a peripheral speed between 50 or 60 ft. per minute and a feed from 0.005 to 0.010 in. per revolution for drills over ½ in. When this is done the following should be carefully observed, as it forms

an important factor in obtaining the most successful results:

If the drill has a tendency to wear away on the outside, it is running too fast.

If it breaks or chips on the cutting edges it has too much feed.

When used in steel or wrought iron the drill should be flooded with a good lubricant or cutting compound. For brass we would suggest the use of paraffine oil. For cast iron an air blast is recommended.

"A little careful experimenting, as suggested, making the changes gradually, will insure maximum results for each particular case, provided there is ample rigidity in the machine. If there is spring between the feeding parts

of the machine and the support of the work, the drill will not penetrate until sufficient pressure is brought to overcome this spring. After that it will maintain practically a constant feed through the work until the work just breaks through, when the resistance to penetration is removed and the spring in the parts forces the drill to 'hog in.' This rapid and sudden increase in torsional stress very frequently breaks the drill."

The Corrosion of Acid and Basic Steel.*

BY ALEXANDER G. FRASER.

The opinion has prevailed among users of steel that acid steel resists corrosion much better than basic, and this was the writer's opinion before making the experiments detailed in the paper. Acid steel suffered from

Acid. Basic.

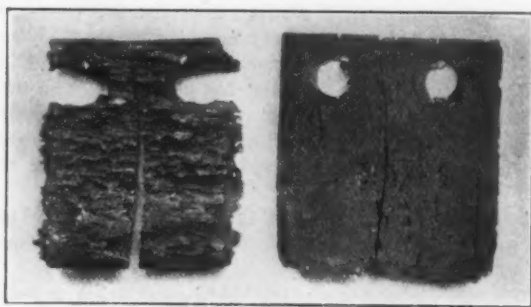


Fig. 1.—Half-Inch Pieces Kept in Dilute Sulphuric Acid Eight Weeks Without Removal for Cleaning.

a like prejudice when it began to compete prominently with wrought iron. It was demonstrated, however, that while the wrought iron resisted atmospheric corrosion somewhat better all other tests showed the corrosion of the two metals to be practically identical. The writer used pieces of steel $3\frac{1}{2}$ in. square, with two holes bored through near the top of each for suspending the pieces so that they might be thoroughly covered with liquid in boxes. The thicknesses used were 1, $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$ in. of both basic and acid steel, the intention being to see what part carbon would play in the corrosion, as this element would vary in different thicknesses. The pieces were cleaned of all scale and oxide of iron. There were five tests lasting over 12 weeks, the respective mediums being the atmosphere, river water, brine from rock salt, a solution of common salt and dilute sulphuric acid. Two sets of test pieces were used in each of the five mediums, one set being cleaned and weighed at the end of each week, while the other set was not interfered with in any way until the end of the period, when the pieces were taken out and cleaned as well as possible before weighing. The idea was that the first set of pieces would show the rate of corrosion, and also whether a cleaned surface is more liable to rapid corrosion. This procedure was departed from in the case of the sulphuric acid test, one set of these pieces being weighed twice weekly, while the action was allowed to go on for only eight weeks, as by that time the second set of pieces was so much corroded that it could not bear its own weight when suspended. The results of the test of the first four mediums are stated briefly as follows:

Tests in Air, Water and Brine.

Atmosphere.—The pieces of each kind of steel and each thickness were placed on top of a hydraulic accumulator, so that the surfaces were fully exposed to varying weather. The first set was washed and weighed weekly. The corrosive action in the first set was slightly higher in the basic, the increased corrosion being an average of 0.019 per cent. over all the thicknesses. In the second set of pieces the action was greater in the basic steel by an average of 0.041 per cent. over all thicknesses. The second set showed small pit marks over the

surface, while in the first set there was no pitting and the corrosion appeared uniform.

River Water.—The pieces were suspended in the North Calder River, which is often polluted by dye matter and carries considerable sewage. The corrosive action in the first set was higher in the basic by an average of 0.021 per cent. over all the thicknesses, and in the second set by 0.014 per cent. average over all the thicknesses. There was good evidence of corrosion in each set, the pitting being irregular and patchy, and the pit marks being distributed over the surfaces as well as on the cut edges. The action in this experiment was entirely different from the manner of corrosion with dilute sulphuric acid, detailed below.

Solution of Brine.—The solution was made from rock salt, and was renewed every four weeks. The basic steel showed a greater loss for the first set of pieces by 0.062 per cent. average over all thicknesses. The second set showed a greater loss in the basic by 0.026 per cent. over all thicknesses. The signs of corrosion were very slight.

Solution of Common Salt.—This solution was renewed every four weeks, and was used to see if the chloride of sodium itself or the mixed chlorides in rock salt had the greater corrosive action. The corrosion in the first set of pieces was higher in the basic by an average of 0.005 per cent. over all thicknesses. The second set showed an excess of corrosion in the acid pieces by 0.006 per cent. over all thicknesses.

Tests in Dilute Sulphuric Acid.

Two pieces of each kind of steel of each thickness were subjected to the action of dilute sulphuric acid (1.05 sp. gr.) in a large lead lined box. The corrosion in the first set of pieces was much greater in the acid than in the basic, being equal to an average over all the thicknesses of 8.43 per cent. more in the acid steel. The difference in corrosion in the second set of pieces is considerably greater, being equal to an average over all thicknesses of 26.24 per cent. more in the acid than in the basic. The following table shows the percentage of loss

Acid. Basic.

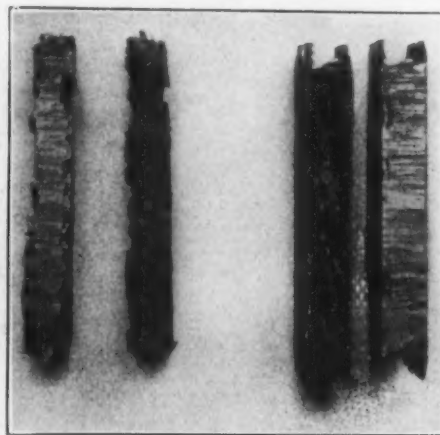


Fig. 2.—End View and Section of Pieces Shown in Fig. 1.

in the second set of pieces which remained in the solution untouched for eight weeks:

TABLE I.
Percentage of Loss by Corrosion of Uncleaned Pieces.

	Acid Steel.			
	1 in.	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	$\frac{1}{4}$ in.
Loss, per cent.	26.68	51.02	51.30	45.63
Excess corrosion, per cent.	15.09	38.32	16.05	35.51
	Basic Steel.			
Loss, per cent.	11.59	12.27	35.25	10.12

At first there was no apparent difference in the solubility of the steels, but the acid steel began to give way at the cut edges toward the end of the second week, and after that the reaction went on more rapidly and by the end of the eight weeks the first set of acid pieces was, even to the eyesight, very badly corroded compared with the basic. This was more noticeable in the $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$ in. pieces, but the 1-in. acid does not show the corrosion nearly so much and compares very well with the 1-in. basic. The difference in appearance of the two steels

* Synopsis of a paper read before the West of Scotland Iron and Steel Institute.

is even more pronounced in the second set of pieces, and by the end of the experiments the whole of the acid pieces were a mere shadow of their former thickness, whereas the only piece of the basic to show any great difference was the 1/2 in.

The sulphuric acid tends to show the fibrous nature of the steel. Practically, the whole of the action was on the cut edges, as the skin was left intact most of the time. This was very noticeable in the first set of pieces of each kind of steel, and more apparent in the second set of basic pieces, as in the 1/2-in. piece the skin is hardly broken while the steel is dissolved well down the inside of the plate. Figs. 1 and 2, made from photographs of the ends and sides of the 1/2-in. pieces of the uncleaned set show the skin of the basic steel to be tougher than that of the acid. Whereas the skin of the acid steel is badly corroded, that of the basic in comparison is hardly marked.

The results show a great difference in the solubility of the first set of pieces compared with the second set. This is the case in both acid and basic steel. It might be supposed that the No. 1 set, the pieces of which were washed and dried at intervals would be more corroded than the No. 2 set; but the writer's view is that as a fresh surface is repeatedly presented the acid has to begin its work over again and the action is thus not so rapid. Another reason is that the galvanic action between the lead lining of the box and the steel is greater on the rough than the cleaned surfaces.

So far as the first four tests are concerned, there is very little difference in the corrosion of the two steels. In the first three the basic steel showed a slightly higher rate of corrosion than the acid, while in the fourth the results are practically equal. The greatest difference was in the 1/4-in. pieces, the 1/4-in. basic showing the higher loss. On the other hand, the 1-in. basic resisted corrosion in all the tests better than the 1-in. acid. The 3/4 and 1/2 in. pieces do not show such uniformity. On the whole, the corrosion from the four treatments was comparatively small. The following table:

TABLE II.

Comparison of Percentages of Total Loss from Corrosion. First set of test pieces, all of which were cleaned and weighed every week.

Thickness.	Atmos.	River	Common	Dilute
Inches.	phere.	water.	Brine.	salt.
				H ₂ SO ₄
Acid pieces.	1	0.226	0.526	0.83
	3/4	0.279	0.651	0.093
	1/2	0.401	0.745	0.071
	1/4	0.620	1.484	0.106
Basic pieces.	1	0.206	0.438	0.075
	3/4	0.301	0.539	0.085
	1/2	0.362	0.790	0.075
	1/4	0.733	1.663	0.102
Second set of test pieces, which were not interfered with in any way until the finish of the experiments.				
Acid pieces.	1	0.228	0.362	0.164
	3/4	0.241	0.354	0.059
	1/2	0.311	0.491	0.034
	1/4	0.541	0.781	0.090
Basic pieces.	1	0.158	0.299	0.145
	3/4	0.239	0.387	0.236
	1/2	0.300	0.521	0.092
	1/4	0.784	0.836	0.042

Table III gives chemical analysis and physical properties of the steel used in the tests:

TABLE III.

Chemical and Physical Properties of the Steels Tested.

Acid.				
	1 in.	3/4 in.	1/2 in.	1/4 in.
Carbon	0.18	0.185	0.17	0.155
Silicon	0.016	0.014	0.019	0.017
Sulphur	0.030	0.032	0.030	0.030
Phosphorus	0.048	0.054	0.045	0.048
Manganese	0.49	0.47	0.50	0.50
Density	7.875	7.876	7.879	7.883
Tensile strain, tons per square				
Inch	28.70	29.90	29.80	31.90
Elongation on 8 in.	29	28	22	21
Elongation on 10 in.	27	26.5	20	19
Contraction of area	53.9	49.20	50	43
Basic.				
	1 in.	3/4 in.	1/2 in.	1/4 in.
Carbon	0.225	0.19	0.20	0.145
Silicon	0.014	0.012	0.014	0.009
Sulphur	0.030	0.026	0.024	0.028
Phosphorus	0.038	0.042	0.035	0.026
Manganese	0.56	0.54	0.58	0.57
Density	7.850	7.868	7.877	7.885
Tensile strain, tons per square				
Inch	30.80	29.40	30.90	29.60

Elongation on 8 in.	27	28	28	23
Elongation on 10 in.	25	26	26	21
Contraction of area	59.1	44.2	46.3	41.5

Cause of the Varying Effects of Acid.

The marked difference in corrosion by the dilute acid the writer considers to be principally due to the power of resistance offered by the skin of the basic steel. If this sulphuric acid test is taken as representing the other forms of corrosion, but in a very concentrated degree, the result would suggest that basic steel would resist corrosion better than acid steel, though, of course, steels are rarely subjected to anything like so severe a test as this. However, it might apply in a less degree to steels acted on continuously by water containing a large quantity of chlorides, nitrates, sulphates or putrefying organic matter. The analyses of the different thicknesses of each kind of steel do not explain the difference in the action with the dilute acid. Although the basic steel contains a slightly higher percentage of carbon the phosphorus is relatively lower, and these two elements might thus balance each other. Manganese, which is said to cause steel to corrode quickly, is slightly higher in the basic steel, but the difference is small. The author's opinion is that the carbon in the basic steel exists in a different form from that in the acid steel, and that it may be due to this that the action is different. The percentage of this element is so low that it would not exert a great influence, but it may cause a certain degree of case hardening during the process of rolling from the ingot to the finished plate, and if this were so it might account for the peculiar manner in which the skin of the basic steel resists the action of dilute acid.

The New England Foundrymen's Association.

The monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, April 10. President W. H. Bense was in the chair. The committee appointed at the last meeting of the association to investigate the matter of shipping conditions, particularly in regard to obtaining redress for short weights in shipments of pig iron, coal and coke, reported it had held one meeting, but as the committee consisted entirely of local members it was thought best to increase its number to 15, the new members to be selected from different parts of New England, in order that there may be a larger field to work in and more definite information might be secured in regard to the conditions existing in this section of the country. The chair appointed 10 new members, making up a committee as follows: Jas. L. Anthony, chairman, Weir Stove Company, Taunton, Mass.; Wm. J. Breen, secretary, Hugh W. Adams & Son, Boston; Walter B. Snow, B. F. Sturtevant Company, Hyde Park, Mass.; Lewis E. Harper, Becker-Brainard Milling Machine Company, Hyde Park; Henry F. Arnold, American Tool & Machine Company, Hyde Park; Henry A. Carpenter, A. Carpenter & Sons Foundry Company, Providence, R. I.; B. M. Shaw, Walker-Pratt Mfg. Company, Watertown, Mass.; W. A. Jackson, Walworth Mfg. Company, Boston; Chas. J. Caley, Russell & Erwin Mfg. Company, New Britain, Conn.; John F. Kyes, Reed Foundry Company, Worcester, Mass.; A. A. Brown, General Electric Company, Lynn, Mass.; Chas. F. Hildreth, Whitcomb-Blaisdell Machine Tool Company, Worcester; C. L. Prince, H. B. Smith Company, Westfield, Mass.; Chas. L. Newcomb, Deane Steam Pump Company, Holyoke, Mass.; C. R. Brown, Saco-Pettie Machine Shops, Newton Upper Falls, Mass.

Announcement was made that the next meeting of the association would be held in Boston, May 8. Roy U. Conger, New York, will read a paper on "Scientific Salesmanship." After dinner Edwin A. Moore, president of the American Coke & Gas Construction Company, Camden, N. J., spoke on "By-Product Coke." A brief discussion followed. A vote of thanks was extended to the speaker for his very interesting and instructive paper.

The Pennsylvania House of Representatives on April 11 passed, by a vote of 138 to 25, a bill taxing anthracite coal 3 cents a ton. A provision to tax bituminous coal was stricken out.

The Luermann Cinder Notch.

BY FRITZ W. LUERMANN, BERLIN.

Molten iron, being three times as heavy as slag, is separated from it in the lower part of the blast furnace, in the hearth A, Fig. 1, below the tuyeres through which the blast enters. Before the employment of the Luermann cinder notch the flow of slag from the hearth A took its way through the fore part C, under the tymp D, over the dam E.

When the furnace charge was densely packed, the center line of the slag overflow was on a higher level than the center of the tuyeres B. As soon as the slag rose to the outlet level F, the fore part between tymp D and dam E was stopped up with ashes, clay and a plate, G, which was then kept in position by the rod H with the weight I acting as a lever. The overflow of slag took place,

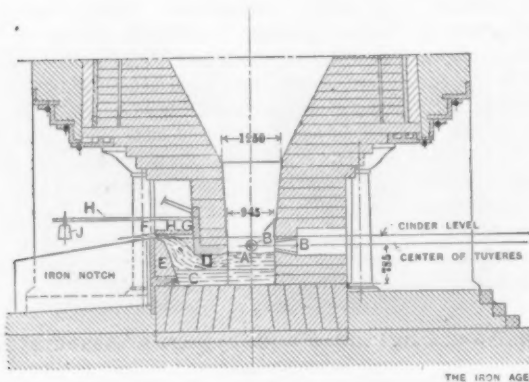


Fig. 1.—Old Form of Blast Furnace

therefore, in accordance with the law of communicating vessels, composed of the hearth A, the tymp D and the dam E.

The difference between the level of the slag outlet above the dam E and the level of the slag in the hearth A corresponded to the pressure exercised by the blast entering at B, and was therefore limited, as was also the region of highest temperature in front of the tuyeres, thus limiting also the diameter of the hearth. The blast was supplied through three tuyeres, B. The liquid slag fluctuated in the hearth A and the fore hearth C under the varying pressure of the blast which corresponded to the change in the strokes of the blowing engine, and in consequence the overflow of the slag over the dam E was intermittent. This continuous movement of the liquid slag destroyed all parts of the hearth A, the fore hearth C, the tymp D and the dam E.

When the pressure of the blast in the hearth became greater, having been increased at the blowing engine, or when the passage of the gases through the charge in the furnace shaft was rendered more difficult, then all the liquid slag in the hearth and fore hearth was ejected over the dam with the plate G, this always causing an interruption of the working of the furnace. As soon as the molten iron had been tapped, these parts of the fore hearth, tymp and dam which had been corroded away by the slag had to be renewed by burning on lumps of clay.

When the working of the furnace was good, the temperature high and the slag correspondingly fluid, the wear mentioned above was very great. The repairs required then took up, after every run of iron, an hour or more and necessitated strong experienced furnacemen to do this most exhausting work. When, as formerly, the furnace was tapped four times there was a daily loss of four or more hours; that is, 16 per cent. of the working time was lost. When, however, the furnace was not in good working order, the temperature and the fluidity of the slags were so low that they could not pass the fore hearth, under the tymp and over the dam, congealing and filling up the space.

The fore hearth C, the tymp D and the dam E, the parts of the structure which, before the introduction of

the Luermann slag outlet, were provided for the outflow of the slag, caused, when the furnace worked well, great loss of working time and also, when the furnace worked cold, became full of congealed slag and were useless as they did not fulfil their purpose. The pressure of the blast, as stated above, was very limited and generally did not exceed $2\frac{1}{2}$ to 3 lb. to the square inch.

The fore hearth, the tymp and the dam were abolished by the introduction of the Luermann cinder notch, Fig. 2. All the above mentioned defects and loss of time were done away with, and in consequence less experienced laborers could be employed as blast furnace men. The pressure of the blast became independent of the level of the slag overflow, as it no longer lies above, but is below the center of the tuyeres B.

The disturbances which have been above described took place in the working of the furnace when the pressure of the blast was greater than required to cause the outflow of the slag out of the fore part over the dam. The slag generally rose, however, as high as the tuyeres and could be observed boiling in front of the blast, and it is evident that thereby the entrance of the blast was obstructed. When the pressure of the blast became less than required to drive the slag through the outlet over the dam at a higher level than the tuyeres, or when no pressure was exercised on the slag, by the blast being suddenly stopped, the slag flowed back into the tuyeres and the blast pipes. The blast pipes were 50 years ago laid in a channel in the foundation of the furnace so that the slag ran into them. It may be well understood that such occurrences were the cause of many tedious stoppages of the furnace. After the introduction of the Luermann cinder notch, when the slag outlet was placed lower than the tuyeres, it became possible to prevent the slag running into the tuyeres and blast pipes, when the blast pressure became less or when the blowing engine was stopped.

Originally, the difference between the center level of the tuyeres and the slag outlet was only 6 in.. When

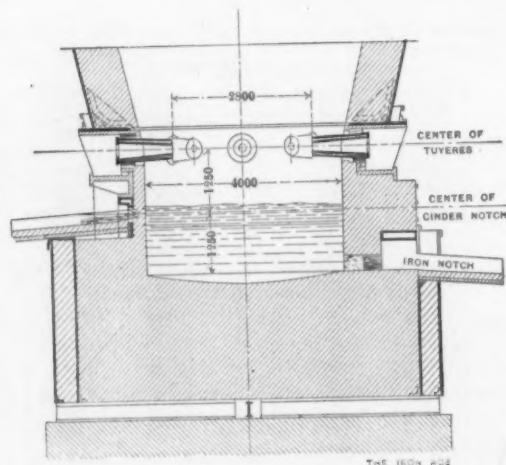


Fig. 2.—New Form of Blast Furnace.

much slag was collected in the hearth, this difficulty could not be avoided by this narrow margin. The experience gathered by the introduction of the Luermann cinder notch and the advantage of its employment led to an increase in this margin between the center of the tuyeres and slag outlet. This margin has now been increased up to 1.7 m. (66.9 in.), at some blast furnaces; that is, the tuyeres lie 2.7 m. (106.29 in.), and the slag outlet 1 m. (39.37 in.), above the bottom. The hearth, with a diameter of 4 m. (157.48 in.) at the height mentioned with $12\frac{1}{2}$ c. m. (441.44 cu. ft.) contents up to the slag outlet, can take up 80 tons of molten iron before it would reach the slag outlet and thereby endanger it. The contents of the hearth up to the tuyeres are then 31.25 c. m. (1103.59 cu. ft.), and therefore there can be 40 tons of slag collected above the 80 tons of molten iron before it reaches the tuyeres. The tuyeres can, therefore, even when the charges are rapidly put into the fur-

nace, be kept free of slag, so that the blast can enter the hearth without meeting any obstruction. The bottom of the hearth becomes hotter the nearer the tuyeres are; that is, when the difference in the height is small and the furnace is in good working order, the bottom is melted and the hearth becomes deeper. This is an occurrence well known to furnace men. Therefore, the tuyeres must be placed at a certain level above the bottom at which the melting of the bottom does not take place.

These high levels described above also have the advantage, when the working of the furnace is disturbed, that the iron settling at the bottom in such cases cannot interfere with the slag outlet and that this can be laid considerably higher before the working of the furnace is endangered. In the present hard driving of the blast furnace, the position of the tuyeres and the slag outlets at a certain height above the bottom of the hearth, as described above, therefore affords great reliability and safety for the responsible manager.

The pressure of the blast now usually applied depends solely on the density of the charges and the height of the furnace. The blast is now given a very much

The flexures taking place in the outer portions of the earth's crust may bring to bear upon deep-seated and perhaps already heated rock masses a sufficient pressure to cause them to readjust their positions, and the conditions outlined above are then present.

The Costello Continuous Annealing Sheet Furnace.

Illustrations are given herewith of a continuous annealing and bluing furnace for the treatment of sheets, invented by Thomas J. Costello, Newark, Ohio, who is prepared to arrange for the installation of such furnaces. The object of Mr. Costello's invention is to produce a simple and efficient apparatus for the purpose, means being provided for holding curved sheets while passing through the entire length of the furnace and without the use of guides, which are commonly employed in furnaces designed for this purpose.

Referring to the illustrations, Fig. 1 is a side elevation of the furnace and Fig. 2 is a cross sectional view.

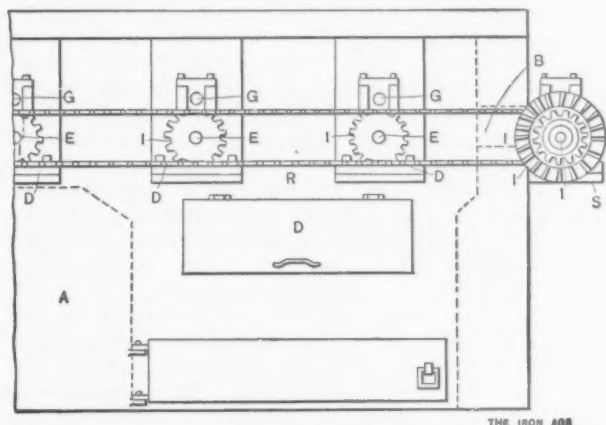


Fig. 1.—Side Elevation

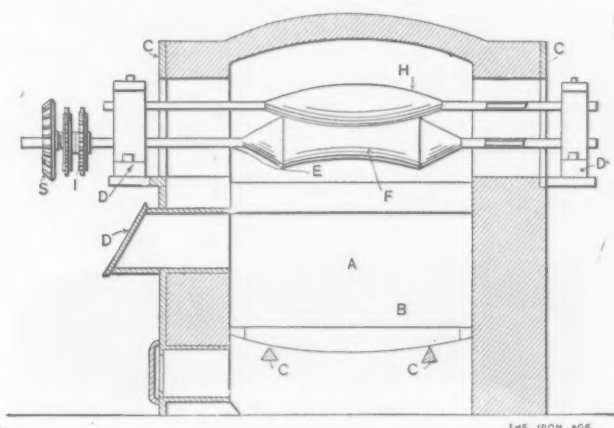


Fig. 2.—Cross Section.

The Costello Continuous Annealing and Bluing Furnace for Sheets.

higher pressure and the height of the blast furnace, formerly 16 m. (52.5 ft.), has now reached 30 m. (98.4 ft.) and more.

The increase of pressure and the correspondingly increased volume of blast has expanded the regions of highest temperature in the hearth considerably as compared with formerly. The number of tuyeres has risen from three to 15, and whereas, before the application of the Luermann cinder notch, the hearth had a diameter of only 0.95 m. (37 in.), it has now a diameter of 4 m. (13 ft.) and even more.

The increase in net working time, and in the volume of blast have been rendered possible by the employment of the Luermann cinder notch. The increase in the diameter of the hearth and in the height of the furnace has also rendered it possible to increase the number of charges and therefore also greatly to increase the production of pig iron.

The action of volcanoes may be explained from the following facts: Any substance upon which work is done acquires heat in proportion to the amount of energy expended upon it. If this heat is prevented from escaping the substance will rise in temperature. If any solid substance, such as rock, be subjected to pressure such as to cause it to flow in a tortuous or restricted channel, formed, perhaps, of harder or more refractory substances, it will in so moving rise in temperature, and will continue to rise until it has such a degree of fluidity as to lessen or practically stop the absorption of energy by the moving mass, or until it escapes from the passage through which it is being impelled. If the distance thus traversed be sufficiently great, it may be that the rock will even partially vaporize when the pressure is suddenly relieved.

In these illustrations A designates the fire chamber, which may be of any desired construction, and B is the opening through which the sheets to be annealed or blued are inserted. On the opposite sides of the furnace are bracket arms, C, upon which the bearing blocks D are mounted, in which the shafts E of the concaved rollers F are journaled. The letter G designates shafts which are also journaled in the bearings D and on which are mounted the convexed rollers H, adapted to conform to the concaved surfaces of the rollers F in the manner shown in Fig. 2. The bracket arms are placed at intervals along the opposite sides of the furnace, and each bracket carries bearings for the ends of the shafts E and G, as shown in Fig. 1. Sprocket wheels, I are fixed to the shafts E, having chains passing about them which impart motion from the shaft carrying the driving pinion S at a uniform speed. The shafts E and G are hollow in order that a cooling liquid may be passed through them while the rollers are subjected to a high degree of temperature incident to the annealing process.

In operation the sheets to be annealed or blued are passed between two rollers at the end of the furnace and outside of it, and are thence fed through the opening B and their inner ends engaged by the adjacent set of rollers. Rollers in pairs placed at intervals serve to receive and guide the sheets while they are being subjected to the high temperature of the furnace, thereby holding the sheets rigidly and giving the same rigidity while passing through the furnace. By holding these thin sheets in a curved manner, as shown, more rigidity is afforded to carry the sheets through the space between the rollers and so on through the entire length of the furnace, thus making it possible to pass sheets without the use of guides.

The Cold Twisted Lug Bar.

The value of different deformations of bars intended for reinforcing concrete and the effect of cold twisting upon the steel have been the subjects of considerable recent investigation and discussion. Among the deformed reinforcing bars, a late one that appears to have much in its favor is the cold twisted lug bar manufactured by the General Fireproofing Company, Youngstown, Ohio. The lugs upon this bar are designed to increase the mechanical bond materially over that of a plain twisted bar having no other deformation. The effect of the lugs is to provide an absolute mechanical bond which is entirely independent of, although it in no way interferes with, the bond due to adhesion. The bar, a section of which is shown in the illustration, it will be seen has no sharp corners or indentations which might start cracks in the concrete. There are various means of artificially deforming a bar to provide this mechanical bond, but none of them, in the opinion of the company, is in any way more effective than that employed in the cold twisted lug bar.

The specifications under which the bars are manufactured provide that all steel may be made by either the open hearth or the Bessemer process, but must have an ultimate breaking strength, before twisting, of between 55,000 and 65,000 lb. per square inch, with an elastic limit of not less than 32,000 lb., and elongation not less than 20 per cent. of the measured length of 8 in. on a test specimen 18 in. long; that all bars must be capable of being bent cold through an angle of 180 degrees to an inside diameter at the bend equal to the thickness of the



A Short Section of the Cold Twisted Lug Bar for Concrete Reinforcement, Made by the General Fireproofing Company, Youngstown, Ohio.

bar, without a sign of fracture on the outside of the bent portion; and that all bars must be straight and free from wind. The bars are of mild steel.

In order to establish as a fact the theory that the cold twisting process has a beneficial effect upon the steel, Dr. Henry Boynton made a microscopic examination of the bar both before and after twisting and reported favorably. Laboratory tests, it is claimed, show that the effect of the twisting is to increase greatly the ultimate strength of the bar, to cause an almost uniform elongation, and to raise the yield point practically to the ultimate strength. In figures the yield point, frequently referred to as the elastic limit, is upward of 75,000 lb. to the square inch, and the ultimate breaking strength exceeds 84,000 lb. per square inch. It is the manufacturer's contention that the cold twisted lug bar has the highest yield point or elastic limit of any bar now on the market.

In addition to raising the yield point, the cold twisting process has another result which commercially is of great importance. When the bar is being twisted cold, if there is a weak point or a pipe in the steel, it will become noticeable at once by an opening of the spiral at the weak point. Conversely, if there is no indication of a weak spot, there is positive assurance that the bar is of absolutely perfect steel. It is interesting to note that imperfect steel cannot be twisted cold although it may be twisted hot.

The company carries a very large stock of lug bars, in sizes from $\frac{1}{4}$ to $1\frac{1}{4}$ in., and is prepared to make immediate shipment of all orders. The bars are cut at the yard according to specification without occasioning any delay.

On March 31 the Westinghouse Machine Company, Pittsburgh, completed its third fiscal year as an independent organization. Prior to that time its product was sold

through another concern. In the three years the company's output has trebled and many additions to the plant have been made. The orders received by the company in the first quarter of 1907 exceed by far the new business secured in the same period of last year.

Cooling Towers.

The possible applications of water cooling towers and the advantages resulting from their use are relatively little appreciated by those not professionally interested. It therefore seems appropriate to reprint the following from a catalogue on cooling towers recently issued by the Alberger Condenser Company, New York.

Cooling towers were commercially introduced into this country about 15 years ago. Since that time they have been installed in a great variety of situations, and have become recognized as an important and valuable adjunct to power stations and refrigerating plants where the water supply is limited. That the experimental stage has passed is evidenced by the fact that numerous steam plants have been located where there is no natural water supply for condensing purposes, and have been equipped with condensing engines and cooling towers. This selection of site has been influenced by better coaling facilities, more favorable distribution of the electric current, the lesser cost of land away from water fronts, and the knowledge that results practically equal to those obtainable with a natural water supply can be had with properly applied cooling towers.

It may at first seem unreasonable to imply that the same results can be obtained, but it must be borne in mind that cooling towers possess operative advantages of considerable importance. When they are used the water supply to the condensers is not liable to be cut off by ice or other foreign material, nor the suction lost on account of low water, as is not infrequently the case where rivers subject to considerable rise and fall are the source of the condensing water. The presence of a supply of water in the cooling tower at practically the ground level allows the condensing apparatus to carry large overloads without loss of the suction. The fixed suction lift thus obtained assures the delivery of a constant quantity of water to the condenser without the use of complicated speed governing devices, which are necessary when a varying suction lift exists, as in the case where the condensing water is taken from a source subject to rise and fall, due to tide or climatic conditions. Freedom from foreign material permits of the use of a more complete spraying device in the condenser, and a higher efficiency follows; furthermore, the durability of the condenser is enhanced, as the water usually contains the oil from the cylinder lubrication of the main engines and is free from any material that can wear the moving parts. The use of the cooling towers also relieves the condenser and pumps from corrosive action caused by the presence of salt and some chemicals often found in natural water supplies.

It is these and other seemingly small points that when grouped together have proved very valuable to the every day running of a steam plant. There is nothing so objectionable as the loss of vacuum through the stoppage of the water supply. Even if the station can carry the load with the engines running, noncondensing, they will be at a great disadvantage and will usually show harshness of action, which may result in a serious disarrangement. A single occurrence of this kind more than offsets any slight difference of steam economy by the use of cooling towers instead of a natural water supply.

The twelfth annual convention of the National Association of Manufacturers will be held at the Waldorf-Astoria Hotel, New York City, May 20, 21 and 22. The convention proper begins its business session on Tuesday, May 21. On the evening of Wednesday the annual banquet will be held. Among those expected to address the convention are Secretary Straus, Senator Dolliver, Congressman Littlefield, Judge Prouty of the Interstate Commerce Commission, and Congressman Currier of New Hampshire, chairman of the House Committee on Patents.

The New Lazier Gas Engine.

A multiple cylinder vertical gas engine of the four-cycle throttle governing type, which embodies several improvements tending to simplicity, certainty and economy of operation and the prevention of disorders, is shown in the illustrations. It is the invention of Arthur A. Lazier, one of the pioneers in gas engine development, and is now being placed on the market by the Lazier Gas Engine Company, Buffalo, N. Y.

One of the special features of the engine is the placing of all of the working parts where they are accessible from the outside, so that inspection and repairs can be made without taking the engine to pieces. The sub-base, upper base, cylinders and heads are cast separate, and there are no moving parts on the inside of the engine except the piston, crank and connecting rod, as may be seen in Fig. 1. The valves are operated mechanically by a cam shaft which runs in oil, but is in plain view of the operator. The drive for the cam shaft and governor is entirely new and very simple, consisting of four spiral gears, giving a practically noiseless system and one that will wear indefinitely, as all the gears run in oil.

The main bearings are provided with wedge take-ups and pin gauges to determine the alignment, and the connecting rod bearings can be quickly gotten at for adjustment by removing the hand plates on either side of the base. The difficulty of taking up the lost motion in the connecting rod, which is a common objection in vertical engines, has been overcome in the Lazier engine by providing an extended take-up, clearly indicated in the cross sectional end view, Fig. 2, by which the lost motion due to the wear of all parts is compensated. The crank shafts are extremely large and are counterbalanced. Lubrication is taken care of automatically by the splash system.

A double system of ignition is provided, the engines being equipped with both the make and break and the jump spark types, adjustable while the engine is operat-

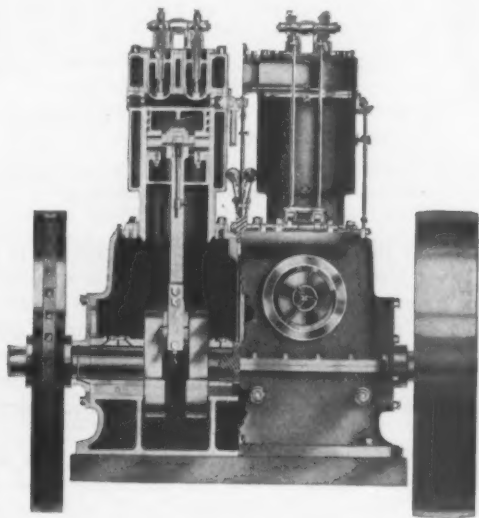


Fig. 1.—Side Elevation, Partly in Section, of the New Gas Engine Built by the Lazier Gas Engine Company, Buffalo, N. Y.

ing, and if necessary the change can be made from one to the other instantly, insuring constant and uniform firing and obviating shutdowns on account of failure of the igniter.

In order to get the best economy all ports in the explosion chamber have been eliminated, the mixture being admitted directly into the cylinder. The valves are interchangeable, are mounted on cages and are removable in a moment. A water cooling system is used by which the cylinders are kept cooler on top, where the heat is most intense, than on the bottom, preventing uneven expansion and making possible a better fuel economy.

For fuel the new Lazier engine is designed to operate economically on producer gas, natural gas, illuminating gas, gasoline, kerosene, alcohol or distillate. With producer gas from coal at \$3 per ton the cost of operation

per year, running continuously 10 hours a day for all working days, is given as \$4 per horsepower.

The engine is arranged to change from natural to producer gas without any material change in the engine or its mechanism. The throttle or mixing valve is balanced and so designed that it cannot become clogged. The engines are provided with automatic self-starters, enabling

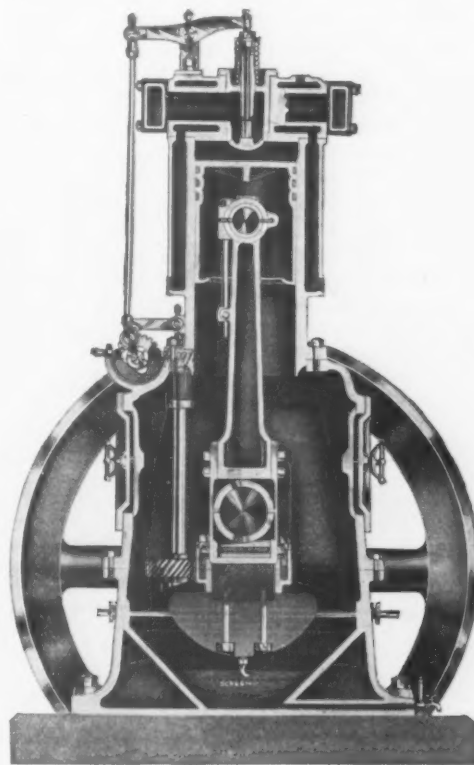


Fig. 2.—Cross Sectional Elevation through One Cylinder of the Lazier Gas Engine.

the operator to start up the engine within 2 min. after stepping into the engine room.

The new Lazier engine is made in four types and in sizes ranging from 2 to 300 hp.

The National Machine Tool Builders Association.

The National Machine Tool Builders Association will hold its semiannual convention at Fortress Monroe, Va., on Tuesday and Wednesday, May 14 and 15, 1907. The Hotel Chamberlin has been selected as headquarters. A large attendance is assured, and the many interesting subjects that may be brought out for discussion will undoubtedly make this meeting an important gathering. The membership has been largely increased in the past year, but the association is desirous of securing the affiliation of the entire trade. An invitation to be present has therefore been extended to any manufacturer of machine tools who is not yet a member, with a view to his becoming acquainted with his fellow manufacturers, and thus perhaps convincing him that it is to his interest to become an active member.

A New Bar Mill at Joliet.—Under the name of the Joliet Iron Products Company, a new organization has been formed at Joliet, Ill., to build a mill for rolling merchant bars. The company is incorporated with a capital of \$200,000, and it is the purpose of those interested to begin work on the new plant without delay. A site has been purchased contiguous to the Rock Island, Michigan Central and the Elgin, Joliet & Eastern railroads, which will afford fine shipping facilities. Those chiefly interested in the new enterprise are J. J. Gaskill, D. H. Lentz and C. E. Woodruff. Following the election of officers, which will take place within a few days, more specific information relative to the plant and its equipment will be obtainable.

The Lap Joint in Boilers.

Is This Responsible for Boiler Explosions?

BY H. S. BROWN.

Before the advent of the compound engine and the consequently necessary use of high steam pressure, nearly every boiler explosion was attributed to low water. Those cases that were reported to be due to some other cause were subjects of much discussion and more speculation, but the final conclusion would often be that the water gauge connection had become clogged and a falsely high water level indicated. Where the fireman was not killed by the explosion, he would almost invariably state that he had noted the water level in the glass just before the boiler exploded. In those days a 60-lb. boiler pressure was the common practice, and the pressure was seldom referred to as the cause of the accident, while the lap joint was never thought of as at all responsible.

The writer was concerned with an occurrence a num-

In boiler manufacture it was formerly the practice to drift the rivet holes, when they did not come in line. The writer has scores of times seen riveters driving a drift pin with a heavy riveting hammer and with so slight a taper on the pin that it was an easy matter to drift holes that were 3-16 in. out of line, as in Fig. 1, so that the rivet would enter. But the result was a sheet strained to the extent that less than one-half the tensile strength remained, and a boiler that should never be put into service. The illustrations in Fig. 1 are exact samples of work done, which was subsequently cut out in repairing the boiler. Suppose a longitudinal seam of the length of one sheet should be riveted up in this manner and the boiler should explode, who would hesitate to say the lap joint was the cause? We shall never know how many boiler explosions have been due to a sheet weakened between the rivet holes by the drift pin.

The statement of a boiler inspector may be called for at the inquest, and he may report that the boiler was, to the best of his knowledge, in good condition a week or a month previous to the accident, and, like the fireman declaring that there was water in the glass gauge, he

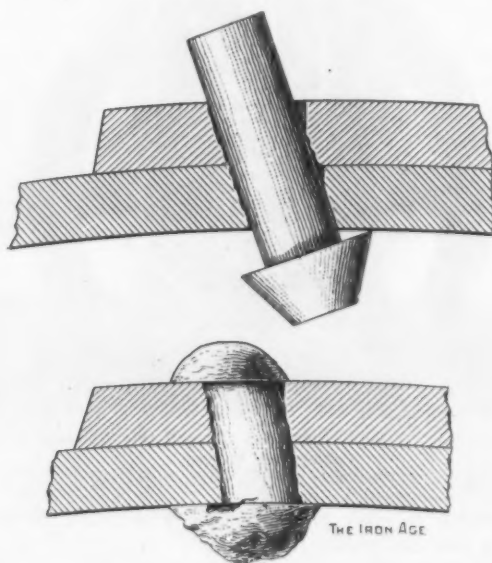


Fig. 1.—Bad Examples of Riveting Possible Where Drift Pins Are Used.

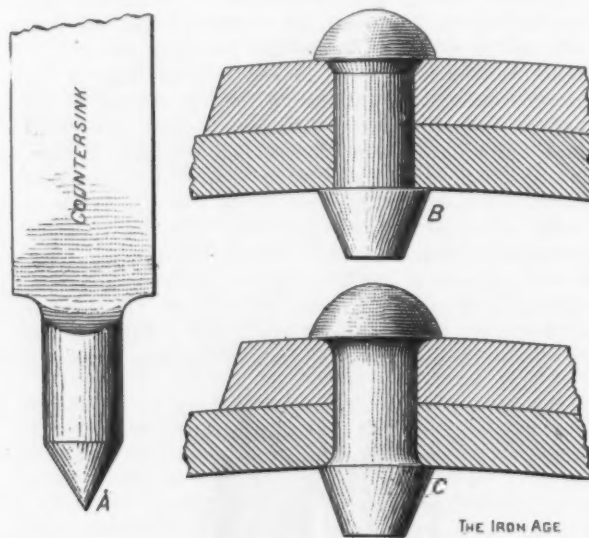


Fig. 2.—A, Countersink for Producing the Result Shown at C. B, the Usual Way of Countersinking.

ber of years ago that has a particular bearing on this matter. There was no room for doubt regarding the cause of the trouble, as the accident was averted in time to save the boiler and its condition was carefully noted. It was the habit of the fireman when relieving his alternate, first of all to examine carefully the gauges, fires, &c. On this occasion he opened the cock at the bottom of the water gauge glass and the water disappeared as usual; but, when he closed it, the water did not reappear. Promptly covering the fire with ashes and green coal and shutting the ash pit doors, averted a serious accident, for it was discovered that water was already dropping from the crown sheet. The boiler was of the type having the furnace and ash pit inside of the shell. Examination revealed that the passage leading from the inside of the boiler to the lower end of the gauge glass had become fouled, so that the water level did not fall with the water inside the boiler. Had the new fireman not taken the precaution to test the gauge, and had an explosion taken place, if his life had been spared he would have truthfully reported that he saw the water at the proper level in the glass, and the cause of the explosion probably would never have been known.

At the present time if a similar circumstance resulted in the explosion of a boiler the lap joint would probably be blamed for it. Lap joints in those days were the rule and at pressures of 60 or 70 lb. they were perfectly safe. But whether a lap or butt joint is used if the gauge system is defective, and the water is allowed to fall below a safe level in the boiler, and the sheets become so weakened from overheating that they cannot hold against the strain, a disaster will follow.

would report the condition just as he found it. It is not possible for him to detect a weak section in a boiler shell that is covered with brickwork, but some cause must be given by witnesses, and the lap joint usually gets the credit. The best safeguard for the inspector and his company, together with the public, is for the inspector to watch every possible detail during the construction of the boiler.

In nearly every catalogue of boiler makers special mention is now made of the use of reamers instead of drift pins. This is commendable, and with other improved methods has made the boiler better in quality and safer in service. The practice of punching the holes is better than drilling in that there is less need of either drift pin or reamer. The writer has noted cases within the past five years where a shell would be punched with such precision that not a single hole would be out of line and the rivets would all enter without any forcing. A modern practice is to drill all holes in the sheets to avoid straining. But unless there is a jig of hardened steel to guide the drill it will run (to use a shop phrase), and the holes will not match when formed for riveting. A thoroughly safe method is to use good sharp punches, and, with a spacing machine, punch the holes about 1/8-in. small, then ream them (with a rose reamer) to size, after the shell has been formed. This cuts away all of the metal that has been in the least strained in the punching, and the holes are perfectly fair in the two sheets.

There are many other points in the construction of a boiler that should receive careful attention and be watched by an inspector. Rivet holes should all be countersunk on the side of the sheet where the rivet is head-

ed down, and the tool for countersinking should be made as shown by A in Fig. 2. This gives the hole a rounded edge, and makes a heading, as shown at C, which is safer than that shown at B. If when the rivets are made they are headed in a die with a fillet then both sheets should be countersunk, for the head and point ends of the rivet. As far as possible sharp or square corners should be avoided, as they always form a starting point for fracture. The rivets will head better with a rounded countersink, and there will be less danger of cold shuts forming in the fillet or neck, leaving the rivet head with little or no strength. These details cost money, but mean much to the safe operation of a boiler, whether it is made with lap or butt joints.

There would be nothing mysterious in the explosion of a boiler if we knew the exact condition of its details during construction, unless the explosion resulted from low water or using the boiler beyond a safe time limit. The writer recalls a happening that illustrates this very clearly, which was a great surprise to all present. In a roundhouse a gang of men was replacing a leaf spring over the driving axles of a locomotive, and finding difficulty in placing the new spring in position a heavy sledge was finally used. A powerful blow that glanced from the spring came against the sheets of the boiler, a loud report followed, and there was a crack about 2 ft. long. It was a lap joint, and if the sheet had given way while the engine was jolting over a switch with steam up there would have been another epitaph written for that style of joint.

In the opinion of the writer, boiler makers use the hammer more than is good for the sheets, even in riveting. A rivet should not be hammered more than enough to head it to shape. Continued hammering after the head has come to a black heat impairs its life. To demonstrate this take a bar of cold, short iron, nick it with a chisel, then break it by bending and it will show a crystalline fracture. The analysis would at once show such stock unfit for rivets. Again, take a bar of the best grade of wrought iron, bend it in opposite directions and it will not begin to break until this has been repeated a number of times. The same bar nicked and bent will show at the bottom of the nick a bluish-colored, silklike fiber, but if after being nicked the bar is struck a heavy blow just at the nick it will break off as squarely as the cold short iron bar and show a similar fracture. It may require several blows in some cases before the bar will break. Even a short distance from this broken end the bar will not be affected, and, if nicked, will bend as it did before without breaking. If the blows from a sledge will affect this bar many blows will affect rivets. It is common to see rivet heads drop off after excessive hammering, and if the hammering is stopped just before the head is cracked a very defective joint is made.

One of the weak points of the lap joint is that if the lap is too short, after pressure has been applied and released a number of times the sheets will be weakened at the ends of the lap, but if the lap is longer this tendency will disappear. The writer once had an experience with a boiler that was made with a short lap, which demonstrated this fact. The boiler supplied a steam pump elevating water several hundred feet and was in turn fed from the discharge of the pump by slightly opening a valve, so as to feed regularly and keep a constant water level in the boiler. On one occasion the valve gave out and the water entered the boiler faster than required and with such force that the longitudinal seams started to leak after the boiler was full. The short lap opened up and allowed the water to escape. Promptly relieving the pressure allowed the joint to go back to its normal condition, but if this had happened many times the joint would have failed resulting in an explosion. This was the fault of an improperly designed lap joint.

There is no doubt as to the value of the butt joint, but with pressure not exceeding 70 lb. it is really uncalled for, although the writer believes that it will soon be universally adopted. There are hundreds of boilers in use having lap joints that have seen from 15 to 30 years' service, but they were properly designed and constructed. Probably in a great many cases boilers have been subjected to excessive pressure from low water

and the matter covered up without inspection or repairs, and a similar condition or a repetition has caused the boiler to burst.

A prolific reason for boiler accidents is carelessness in inspecting. Although it may seem overdrawn this is a conservative statement. No man encounters such cases more directly than the consulting engineer, if he is a practical man and thorough in his examinations. Here are two illustrations: In a certain power plant a new chief engineer was employed. After examining the boilers carefully he requested a special examination by an expert, and as a result the pressure was reduced and very extensive repairs ordered. In another instance a large power plant, not giving the result expected, an expert was asked to go through the plant and locate the trouble. During the inspection, while opening the blow-off cock, he noticed that the pipe was not as rigid as it should be, and discovered that the thread on the pipe where it entered the boiler was nearly rusted away. The boiler was so filled with scale and rust inside that it held the pipe and prevented a leak. The pipe was removed and the boiler had to be patched. Had this man passed over this part of his inspection an explosion would have followed later on, and as the boiler was lap

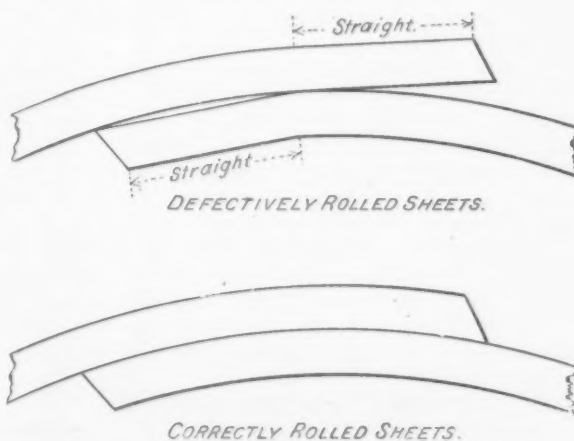


Fig. 3.—The Wrong and Right Conditions of Sheets Before Riveting.

jointed that fact would probably have been given as the explanation. The writer is not an enthusiast on the lap joint, but believes that many things have been laid at its door for which it was in no way responsible.

Not less important than the rivets and riveting is the forming of the sheets. If great care is not exercised in rolling there is danger of flat sections, as shown in the upper view in Fig. 3. In riveting a joint or seam it is common to draw the laps together with bolts, and then rivet as the bolts are removed. If the sheets do not lie closely together, light sledges are used to hammer them into contact, but this will not make a satisfactory job, as the bolts hold the sheets, and even after the rivets are driven there is a tension that acts against the heading. The sheets should be rolled so that they will lie close together naturally, as shown in the lower sketch, Fig. 3, and the same is true with either a lap or a butt joint.

As little hammering as possible should be done on the sheets of a boiler, as it is damaging to the material, besides being a waste of time. In fact, it would be well to anneal the sheets after they are formed into shape by heating them evenly to a red color and allowing them to cool, protected from cold drafts of air.

No material should be used in the construction of a boiler until it has passed the test of a competent chemist. A bar of poor stock made up into rivets might be the cause of an explosion. One of the reasons for the success of the butt joint is that, on account of the number of explosions in the past, greater care has been taken in the selection of material and in the design of the seams or joints. Forty years ago one never heard of a chemist connected with a machine or boiler shop, but to-day his position is nearly if not quite as important as that of the superintendent or designer.

In considering this matter of joints, the writer has not made use of speculation in the main, but has taken cases that have come to his notice from practice. It is not always the case that low water or defective seams or joints have caused an explosion, for the reason that many such troubles have been discovered in time to ward off the dangerous result, but if we could obtain the exact history of every boiler now in service or in the scrap yard it would shed much light on the subject of boiler explosions.

The Denatured Alcohol Regulations Criticised

WASHINGTON, D. C., April 15, 1907.—A movement is being set on foot by handlers and consumers of denatured alcohol to secure the amendment of the existing internal revenue regulations along more liberal lines in connection with the general revision to be made by the bureau before the supplemental legislation enacted at the recent session of Congress goes into force on September 1. It can be said that the officials are not unmindful of the difficulties that have developed in the execution of regulations which were necessarily more or less experimental and tentative, and there is good reason to believe that many of the obstacles in the way of the unrestricted use of denatured alcohol will be removed when the revised code is prepared.

Among those most earnestly demanding the relaxation of the present regulations covering the use of completely denatured alcohol are the prospective consumers of this product for heat, light and power purposes. The argument in favor of the removal of the present restrictions is based upon the necessity for minimizing the cost of denatured alcohol for these purposes, in order that it may be brought into competition with petroleum products, and also upon the fact that, being completely denatured under official formula and Government supervision, the removal of all restrictions upon the handling or use of alcohol is entirely compatible with the fullest possible protection of the revenues.

The Complaints Made.

The complaints with regard to the present regulations relate, first, to the restrictions placed upon dealers and consumers in the handling and use of denatured alcohol; and, second, to the complicated system of bookkeeping devised by the Internal Revenue Bureau. It goes without saying that the success of the free alcohol policy adopted by the Government must depend far more upon the system of distribution permitted by the Internal Revenue Bureau than upon any other single condition, except the actual cost of production. Notwithstanding this fact, which in the abstract is recognized by the revenue officials, the practical operation of the regulations has developed such restrictions that in some sections of the country more permits to handle alcohol are currently being canceled than issued.

Before the existing regulations had been carefully analyzed, it was assumed that retailers of completely denatured alcohol, for example, could buy and sell the product without restriction. It now develops that under rulings made in a number of internal revenue districts, and not abrogated by the bureau, a retailer cannot sell more than 4½ gal. of alcohol in any one day to a single purchaser. This ruling is based upon the technical specification of the regulations that any one dealing in alcohol in quantities of less than 5 gal. shall be regarded as a retailer. It would appear to the lay mind that this specification is designed merely for purposes of classification, but it appears to have a practical application that promises to be embarrassing to thousands of consumers, and that cannot fail to limit the production and consumption of alcohol in all parts of the country.

Another requirement of the regulations—namely, that alcohol purchased in quantities of 5 gal. or more shall be delivered in the original package—has been found to add greatly to the cost of the product. The construction of these packages as prescribed by the regulations involves the use of heavy tin plate covered substantially with wood, the cost thereof ranging from 5 to 7 cents per gallon, a practically prohibitory differential in competition

with petroleum products. It is true that the packages may be reused, but they must be returned to the producer for that purpose, and the freight charges and incidental trouble are calculated to offset any rebate that might be allowed by the distiller or denaturer.

Many of the complaints that are now being made against the existing regulations are not altogether valid, but are based upon a lack of knowledge of the comparative ease with which reasonable official requirements can be met in a well organized industry. They are not altogether without point, however, and they serve to illustrate the obstacles which must be overcome before the use of denatured alcohol can become popularized. Prof. S. L. Bigelow of the University of Michigan recently made an elaborate investigation of the free alcohol question with special reference to the new law and regulations adopted by the United States, and has prepared a paper on the subject in which he makes some very severe strictures upon the present code of regulations. He concludes:

It does not seem too much to say that the present rules about explode all hopes that small factories can be established in rural districts to convert an overproduction of potatoes and the like into fuel, a source of light or a readily transported and marketable product. It does not seem too much to say that these rules inevitably throw the new industry into the hands of established distilleries—i.e., into the hands of the whisky trust.

Complaints Receiving Careful Attention.

It is only fair to state that the internal revenue officials are studying carefully all the complaints and suggestions that have been received by the bureau and are endeavoring to remove the basis of every reasonable objection. Much improvement is expected from the liberal provisions of the supplemental alcohol law, which does not go into force until September 1. This law is specially designed to cheapen the cost of distributing alcohol, and it is expected that under its provisions completely denatured spirits will pass to the consumer almost as freely as gasoline, kerosene, &c. The law, as generally construed, will permit the use of the familiar tank wagon in distributing spirits for domestic purposes, for use in small manufacturing plants, and to supply the tanks of automobile garages, motor boat stations, &c.

It will, of course, require the experience of more than a few months to fully develop the details of the Government's policy with respect to the supervision of alcohol producers and users, but it may be confidently predicted that much of the red tape of which complaint is now made will soon be shorn away, and that the coming year will witness most interesting developments in the use of denatured alcohol. The predictions with regard to the cost of this product made before the law was passed have already been more than fulfilled, and it may be expected that before the end of the current year alcohol will be sold as low as 25 cents per gallon, f.o.b. the distillery.

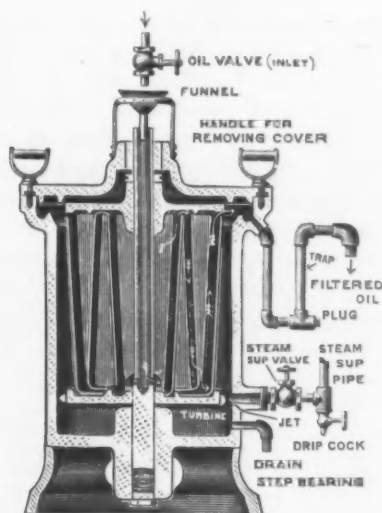
W. L. C.

F. W. Walker of Beaver Falls, Pa.; B. O. Haugh, Anderson, Ind., and Charles M. Cooper, Indianapolis, Ind., a committee representing the National Tile Manufacturers' Credit Association; C. F. Lorenzen, Chicago, and S. H. Calkins, Baltimore, representing the National Tile and Mantel Dealers' Association, recently visited the Winona Technical Institute, Indianapolis, to inspect the department of tile setting, which has just closed its first term. Twelve boys learned in seven months what would have required three years under the old apprenticeship system. With the exception of finishing some decorating at the Institute and at Winona Lake, they are ready to take regular employment in the larger tile-making factories.

The difficulty of surveying deep bore holes, it is said, have been overcome by photography. The apparatus consists of a long brass cylinder containing a small watch, a dry battery, two miniature electric lamps operating in connection with a compass supported upon gimbal bearings, and a suspended plumb bob. At a predetermined time the watch makes a contact, lighting the lamps. By the light thus furnished the positions of the plumb bob and the magnetic needle are photographed upon a small disk of sensitized paper, which is treated in the usual way, becoming an autographic record of the survey.

The Turbine Centrifugal Oil Filter.

A machine for cleaning oil, which is of a novel principle in its construction and operation, is the turbine centrifugal oil filter manufactured by the Oil & Waste Saving Machine Company, Philadelphia, Pa. It is driven by a single wheel steam turbine mounted near the lower end of its vertical shaft, which requires no attention beyond the turning on and off of the steam to start and stop it. The illustration shows a section of the machine with the parts and their purposes identified so clearly that little description is necessary. The oil is introduced into the filter through the hollow shaft of the turbine, while the machine is running, and is sprayed through holes at the bottom of the hollow part of the shaft upon the filtering cloth and filter paper, which are supported



The Steam Turbine Driven Centrifugal Oil Filter Made by the Oil & Waste Saving Machine Company, Philadelphia, Pa.

by conical drums revolved by the turbine. The centrifugal force carries the oil through the filtering materials and over the surface of the drums in sequence, from the inside to the outside, until it escapes through the outlet near the top.

The oil continually passes through clean filtering material for the reason that as soon as the first part of the filtering material encountered becomes dirty or dammed up, the oil takes a new course through the nearest clean part. This is a great advantage over former filtering processes, in which all of the filtering material is exposed to the dirt in the oil at once, and soon becomes so fouled as to greatly retard the filtering or allow the dirt to be carried through with the oil.

The filter can be taken apart quickly by loosening the handles at the top and removing the cover, and the filtering materials can be cleaned and used over again, with the exception of the paper through which the oil passes, which is so inexpensive that it is cheaper to renew it.

An Electrically Driven Paper Mill in Japan.

Representatives of the Oji Paper Company, Tokio, Japan, have for some time been inspecting electrical properties in the United States preparatory to installing an electrically equipped paper mill in Japan. As a result of their investigations orders involving over \$1,000,000 have been placed in the United States for a very complete electrical and mechanical equipment. The mills will include, in addition to the motor equipment of the paper making machinery, a new hydro-electric plant, with a 15-mile transmission line and substation. The electrical equipment will be furnished by the General Electric Company.

At the power station there will be installed four water wheel driven three-phase 3125 KVA units generating current at a potential of 3450 volts at a frequency of 60 cycles. In the paper mill five 750-hp. 2000-volt induction

motors will be used to drive the pulp grinders. Each motor will have an extended shaft, and will be so placed between two pulp grinders that both grinders can be driven directly without belting. Four beater machines are to be driven, each by a 350-hp. induction motor operating at a potential of 2000 volts. A fifth will be driven by a 200-hp. induction motor, and all will be operated on the rope drive system.

The Oji paper mill will be situated at Hokaido on the seashore facing the Pacific. It will be an excellent example of modern engineering practice, of which there are coming to be so many typical installations in Japan.

The Powell Blow-Gun Air Valve.

It is quite a common practice now in shops where compressed air is available to use it in place of a brush for removing dirt or chips from machine tools, work benches, &c. It does the work quicker and more thoroughly than a brush, and if there has been any drawback it has been in the way the air was turned on and off. Usually a screw stem valve or plug cock was used, which required a little waste of time or effort to operate. Lately the William Powell Company, Cincinnati, Ohio, has brought out a very interesting contrivance to take the place of these less convenient styles of valves. It is intended to go directly on the end of the hose, and combines the nozzle and valve in one part. A mere pressure on the button at the top of the valve by the thumb of the hand which grasps it instantly gives a full opening to the passing of



The Blow-Gun Air Valve Made by the Wm. Powell Company, Cincinnati, Ohio.

the air, and releasing the thumb allows the valve to close automatically by the pressure of the air itself, without springs or other means.

The illustration shows the simple form in which the valve is manufactured. The body and all of the parts are brass and the seat and disk are ground. If the valve becomes leaky, regrinding is easily accomplished by removing the button head screw at the bottom, which exposes the disk, and with a little fine sand and water this may be ground by inserting a screw driver in the slotted end of the valve disk. The nozzle ends are made with a screw thread to take tips of different forms or sizes of discharge opening. At present the valves are made in sizes corresponding to pipe connections at the inlet end of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ in.

There are 14 interurban electric roads entering Indianapolis, Ind., operating in all 400 cars in and out daily. They carried to and from the city in 1906 over 5,000,000 passengers. The mileage of these roads in the State is 1650. When a gap of 30 miles is filled between Crawfordsville, Ind., and Danville, Ill., and another small gap between Fort Wayne, Ind., and Bryan, Ohio, which it is expected will be done within a year, Charles N. Wilson, president of the American Engineering Company, Indianapolis, says it will be possible to take a sleeping car at St. Louis and by continuous electric roads travel to Indianapolis, Louisville, Cincinnati, Dayton, Toledo, Detroit, Cleveland, Erie, Pa., and Buffalo, and at no distant day to Pittsburgh.

would secure, among other important purposes, opportunities for members of the trade to confer with one another daily, thus enabling them to keep in closer touch with business conditions than is now practicable. The various other organizations with which the trade in New York is connected meet only once or twice a year. Even at those infrequent meetings much benefit is derived through the interchange of opinions of representatives of widely scattered sections and a fairly correct estimate of the course of business in the near future can be made. More frequent meetings would naturally result in greater benefit. To be able to gauge business for months in advance is of vast importance to all business men, whether dealers or manufacturers, and an opportunity to do this, it is believed, is offered in the proposed club.

Aside from the social advantages to be secured, and looking at the organization purely as a business proposition, it would seem that members will be well recompensed for their connection. One of the features contemplated is a large nonresident membership, which with the resident membership, it is hoped, will include all of the more important buyers of mechanical equipment, in addition to the manufacturers and dealers, in this section of the country. Should this be accomplished, and there is no reason why it should not, it would not only give the manufacturers and dealers a chance to become acquainted with the varied wants of the purchasers, but also the prospective requirements of the leading interests. They would also be in a position to learn of the condition of business of those who use their products. Such information would be of great value, not only in securing orders, but also in getting an accurate idea as to the trend of business, whether upward or downward, and thus form a basis for determining the volume of production and the purchase of raw materials for future delivery.

The Public Free Employment Office.

There is a growing opinion that the public free employment office, although doing a certain amount of good, is not directing its influence in the field where it would be of highly substantial benefit to the community—namely, assisting in the better distribution of newly arrived immigrants. It is moreover claimed that mingled in the results of the institution, as now established, are certain demoralizing tendencies, especially in the encouragement of a class of men who may be called industrial vagrants, men who are constantly changing their employment. The free employment office gives to these people an opportunity which they gladly embrace, for it assists them in finding new work whenever they tire of the old. The number of such men is by no means small, as all employers of labor will testify from their own experience. They work just long enough in an establishment to reach the point of usefulness and then pass to another place, leaving a break in the industrial system behind them. Like any other taint of character, to foster it is to develop it to more and more pronounced proportions.

It must be distinctly understood that the labor bureaus of the metal trades associations and kindred bodies are not to be classed with free employment offices maintained by cities and States. The functions of the two institutions are similar, but here the likeness ceases. The stronghold of the Metal Trades Labor Bureau is that it maintains a record of the men who apply for work and for whom it secures work. When a man leaves one occupation for another the fact, with perhaps the circum-

stances, is entered upon a card bearing his name. If he is a vagrant it quickly shows up in his record, and he need no longer be recommended for employment. No free employment office, however, could maintain such records. In the first place, they would grow to unwieldy proportions after a few years, and, more important still, the office could have no way of getting at the employer's side of the reasons for the workman leaving a position. Every class of employment is sought and by both sexes, and the total applications may run into thousands each month. To study individual cases would be an impossibility, consequently little real knowledge of applicants for work can be obtained, which is a condition in sharp contrast to that of the specialized bureau of the metal trades associations, where records are easily maintained because the field is limited, and are accurate because obtained both from employer and employee. Where this system has been in use for some time it is recognized by the workman as well as by subscribing manufacturers to be a strong factor of mutual benefit.

To return to that latent function of the public free employment office, the assistance of immigrants, it is claimed to be perfectly feasible to substitute for the careful attention given to persons already established in the community the effort to shape the destinies of the foreigner newly landed in America. The newcomer, ignorant of everything about him, geographically, socially and industrially, is at a great disadvantage as compared with those who have already established a residence and a vocation, as is the case with the great majority of those who apply for work at the employment offices. The office could go after the immigrant. It could act as intermediary between him and employers of labor outside of the great cities. The suggestion of immediate employment should be a potent influence in shaping his course to communities where congestion is unknown and where able-bodied workmen, even of foreign tongue, are eagerly welcomed. It is not difficult to see where concentrated effort of this sort, under the auspices of the State, following along the general lines already adopted by various private organizations, would bring about really important results. Under such a system assistance in securing employment would be restricted to persons properly classed with immigration. It need not be argued that the present public free employment bureau is entirely useless in order to make a strong plea for what would seem to be much greater usefulness.

As the matter now stands, the free employment office does scarcely anything in finding employment for those classes of immigrants that need help more than all others of the people who are to assist in, or be an incumbrance to, the development of the United States. The report of the Boston Free Employment Office, recently established and maintained by the State of Massachusetts, proves this. A summary of business for 74 days ending February 28, 1907, shows that 12,973 males registered applications for employment, 6433 positions were offered and 1493 positions are known to have been filled, employers having returned cards to show the fact. Of the class of those given employment under the system, only 453 were foreign born, and somewhere about 70 per cent. of these were from English speaking countries. It is significant that the classified list includes a comparatively small number of those nationalities that seem to have the natural inclination to cling to the great cities. There were 3 Austrians, 2 Fins, 3 Greeks, 18 Italians, 4 Poles, 3 Syrians and 59 Russians. On the other hand, those nationalities which are rather apt to seek the country and smaller cities and towns are strongly in evidence, as

the following figures show: Canada 23, England 80, Germany 17, Ireland 112, New Brunswick 15, Newfoundland 5, Nova Scotia 34, Prince Edward Island 13, Scotland 18 and Sweden 17. It will be noted that most of those countries which send over the greatest number of immigrants show least among those who have profited by this employment office.

Of course, it is much easier to find employment for English speaking immigrants than for those of alien tongue; and for such men as Sweden and Germany send to America than for those who have not had the advantage of good educational institutions in their native countries. For this same reason it is easier for the English speaking immigrant, the native born workman, and the man trained to be an expert in his home country to secure employment without the assistance of any employment office. The man who needs assistance is the unskilled workman, who can be trained, as many thousands of them have been trained, to become a useful member of an industrial establishment. To assist in getting immigrants outside of the large cities is a work of much importance in itself.

The Character of Our Pig Iron Imports.

The import movement in pig iron for ordinary domestic consumption in the past six months draws attention to the character of those imports which are being made with more or less regularity all the time. Prior to the second half of 1906 there was no tendency to import ordinary pig iron for regular domestic consumption, yet the monthly Government figures showed total imports of pig iron in the fiscal year ended June 30, 1906, of 271,790 gross tons, against 122,977 tons in 1905. During the fiscal year 1905, then, pig iron of some description was being imported at the rate of about 10,000 tons a month, while in the following fiscal year the imports were at the rate of 22,600 tons a month. In December, January and February last our imports were from 50,000 to 75,000 tons a month, the excess presumably representing ordinary pig iron imported for ordinary domestic consumption.

While the monthly Government statistics of imports put the imports of ordinary pig iron, of ferromanganese, of spiegeleisen, of ferrosilicon and of other special grades into one total designated pig iron, the annual statistics of imports for consumption give more details. The figures for the past five years ending June 30 have been as follows in gross tons:

Fiscal year.	Ferro-manganese.	Spiegel-eisen.	Ferro-silicon.	All other.	Totals.
1902.....	37,618	31,416	3,568	85,968	158,570
1903.....	53,121	122,566	23,795	749,527	949,009
1904.....	23,903	50,620	6,262	104,201	184,986
1905.....	41,166	22,443	6,834	54,342	124,785
1906.....	62,064	88,224	10,275	110,676	271,239

The great scarcity in pig iron which developed in the calendar year 1902 is reflected in the total of "all other" pig iron in the fiscal year 1903, which covered the second half of the calendar year 1902. The momentum of that unfortunate movement was so great that it even swelled the figures for the fiscal year 1904. In the fiscal year 1905 the general import movement had dropped to normal proportions, with but 54,342 tons of pig iron imported outside of silicon and manganese metals. In the fiscal year 1906 there was a jump of 56,000 to 110,676 tons.

The bulk of these imports were of pig iron intended for the manufacture of exported products, with the benefit of drawback. In the fiscal year 1905 drawback was paid on 49,774 tons of imported pig iron of all descriptions and in the fiscal year 1906 on 80,069 tons.

It is possible to discover the destination of much of

the pig iron on which drawback was allowed in the fiscal year 1906. The following table shows the tonnage of rails exported with the benefit of drawback in the fiscal year 1906, by ports, and with the amount of drawback allowed:

Port of export.	Rail tonnage.	Drawback allowed.
Baltimore	138,878	\$194,884
Boston	300	104
Cuyahoga District.....	6,152	2,136
Puget Sound.....	16,331	5,659
San Francisco.....	4,725	1,636
Totals.....	166,386	\$204,419

The total rail exports in the fiscal year amounted to 345,826 tons, so that almost half obtained the benefit of some drawback in duty. As the duty on pig iron, ferromanganese, spiegeleisen and ferrosilicon is uniformly \$4 a ton, it is easy to observe that the drawbacks allowed at all the above named ports, except Baltimore, represented the amount of spiegeleisen needed to make a ton of rails, the drawbacks averaging 35 cents per ton of rails. With Baltimore, on the other hand, the drawback per ton of rails amounts to about \$1.40. Evidently the rails exported through Baltimore were in considerable part rails made from imported pig iron.

Of the 80,000 tons of pig iron on which drawback was allowed in the fiscal year 1906, between 30,000 and 40,000 tons went into exported rails. The bulk of the remainder went into billets and structural shapes. Whether this movement will continue when the domestic scarcity is removed remains to be seen. Prior to 1905 there was very little drawback pig iron.

The Shop Training of Salesmen.

Some machinery houses are putting into practical operation a plan for the special training of young men who are to become their salesmen, and machine tool builders are co-operating with them in the work, realizing that the results should be as beneficial to their own interests as to those of the dealers. The young man, chosen for his good general education and for the promise of those traits which would fit him to become a salesman, is sent into the works of the several manufacturers whose tools he is to sell, and is given a thorough, all-round training in the mechanism, scope, efficiency, advantages, selling points, &c., of each machine. He goes from one shop to another, receiving in each the instruction, entirely practical, which should be valuable to him later when he comes in contact with the trade.

Many machinery salesmen, though by no means all of them, have served their time in a machine shop, and owe much of their success to the knowledge gained thereby. It is not only an advantage in selling machinery, but it also counts for much in holding the customer, in maintaining a relationship with him so strong that he will naturally turn to this salesman or to his house whenever he is in need of new equipment. The practical knowledge helps in many instances in straightening out complaints after machinery has been delivered. It often happens that a tool new to the buyer's shop is not well understood and does not produce what has been promised by the dealer or manufacturer, and in such a case a salesman with a thorough knowledge of the machine can give the necessary instruction and remove the cause of complaint. He can be of much assistance to customers by practical criticism and suggestion, and services such as these are very likely to result in material advantage when it comes to the placing of machine tool orders. A college bred man could do worse than seek such a training, for the combination of education

and practical knowledge, with possibly some native shrewdness and notably an agreeable personality, should be highly valuable. As the plan is now being worked out young men with a high school or manual training school education are sought.

Another form of specialized training, along related lines and for a somewhat similar purpose, is that of the demonstrator and instructor, who has become an important member of the selling force of certain machinery establishments. If a machine has something of a special nature, involving a knowledge beyond that of ordinary shop practice, as in the case of some of the modern grinding machines, it is important that its initial operation in a shop shall be under the supervision of a man specially trained for the task. A skilled workman of more than average intelligence is usually chosen. He is put to work in the home shop, mastering the machine from all sides—its mechanism and operation, its possibilities and limits, always striving to lengthen out the latter, and its appurtenances, as, in the case of the grinding machine, the abrasive wheel, which constitutes no small subject in itself. Once a master of his subject, he goes out with machines to customers and instructs their men how to operate to best advantage. Machine tool builders will realize how difficult it is at times to get their tools established on a basis which they consider standard, a process which may mean the overcoming of strong prejudice. The demonstrator removes much of the annoyance incident to such cases and not infrequently he develops the ability to assist actively in securing orders. Both the training of the salesman and that of the demonstrator are along the lines of progressive selling methods and constitute examples of highly developed specialization which bring results commensurate with the expense and trouble involved.

The Steel Corporation's Annual Meeting.

The annual meeting of the stockholders of the United States Steel Corporation was held in Hoboken, N. J., April 16, with Judge E. H. Gary presiding. Directors whose terms of office expired were promptly re-elected, as follows: Edmund C. Converse, Elbert H. Gary (chairman), James Gayley, J. Pierpont Morgan, Thomas Morrison, George W. Perkins, Henry Phipps and Henry H. Rogers.

The principal business before the meeting was the ratification of the lease of what is generally known as the Hill ore lands to the Great Western Mining Company on a royalty basis, the United States Steel Corporation to guarantee the lease. As soon as the resolution to confirm this lease was brought forward the only contest of the day began. Clarence H. Venner read a statement in which he recited the fact that he had recently instituted a suit against the Great Northern Railway, had asked for a receiver to take possession of and to liquidate all its properties, that the lease is invalid and that neither the Great Western Mining Company nor the United States Steel Corporation can obtain any valid right under said pretended lease. His firm, C. H. Venner & Co., handed in a written protest against the execution of the lease, or leases, and against the United States Steel Corporation executing any guarantee of the leases or agreement. As soon as these proceedings were concluded the motion to confirm and ratify the lease was put and carried.

The Bessemer Pig Iron Association, the Bessemer Limestone Company and allied interests have leased the entire top floor of the new Stambaugh Building, to be erected on the site of the Park Hotel, in Youngstown, Ohio. J. G. Butler, Jr., is chairman of the two companies named above.

First Report on the Production of Denatured Alcohol.

WASHINGTON, D. C., April 17, 1907. —The Commissioner of Internal Revenue has compiled the statistics showing the production of denatured alcohol in the United States during the first quarter under the new law, the output being 1,111,676 wine or commercial gallons, or at the rate of rather more than 4,400,000 gal. per annum. Of course the figures for the first quarter cannot be said to foreshadow the production of the entire year for obvious reasons. The output by States for the first three months of 1907 is shown in the following table:

	January. Gallons.	February. Gallons.	March. Gallons.
Illinois	504,259.58	261,709.20	208,021.21
Indiana	69,189.78	34,739.63	32,757.11
Totals	574,449.36	296,448.83	240,778.32

In the case of both Illinois and Indiana, it will be noted that the output in January was much greater than that in either February or March, and, in fact, about equaled the production during the latter two months. This should not be accepted as indicating that there has been a falling off in the demand for denatured alcohol since January, for, as a matter of fact, there has been an increase in actual consumption. Distillers of spirits intended to be denatured, however, produced considerable stocks of pure grain alcohol in advance of the taking effect of the law, and these stocks were denatured in January in such quantities as to exceed the demand for that month.

The statistics for the first year under the new law cannot be regarded as a fair criterion of what may be expected in the way of production and consumption. The elaborate regulations adopted by the Internal Revenue Bureau for the protection of the revenues have been found in many cases to be almost prohibitory, but are being liberalized as rapidly as possible. Thus far, however, they have operated to restrict consumption materially. Another important influence against large initial production and consumption has been the passage of the supplemental law enacted in the closing days of the last Congress. This law makes such radical changes in the original statute that producers, dealers and consumers are deferring the execution of their plans until the changes are put into effect on September 1, when it is safe to say there will be a very decided increase in both production and consumption.

A consideration that should not be lost sight of in this connection is the effect of the passage of the free alcohol law on the price of refined wood alcohol. The moment the new law went into force the price of wood spirits was cut by the producers to a parity with ethyl alcohol, or approximately from 70 cents to 40 cents per gallon, and has since been reduced to about 30 cents. Every effort has been made by the wood alcohol manufacturers to hold their old customers, and in many cases with complete success, owing to the freedom from restriction and governmental supervision which refined wood alcohol enjoys. The two articles are sold side by side, and at the same price, and it is not surprising, in view of the elaborate records heretofore required of wholesalers and retailers, that many of them should have decided to carry wood spirits only, and have applied for the cancellation of their denatured alcohol permits. This condition will not continue, it is believed, for the desirability of denatured alcohol for hundreds of purposes is being daily demonstrated, and of course dealers will hasten to provide what the public wants.

W. L. C.

Naval Gun Forging Bids.—Bids were opened at the Navy Department April 10 for nickel steel forgings for naval guns, the total contract amounting to about \$1,600,000. The Midvale Steel Company and the Bethlehem Steel Company put in identical bids of 30 cents a pound for all forgings. The Crucible Steel Company of America, Harrison, N. J., bid 29½ cents a pound on the smaller forgings, consisting of three sets of 6-in., 50 calibre forgings, but did not bid on the larger sizes.

German Tariff Negotiations Satisfactorily Concluded.

WASHINGTON, D. C. April 17, 1907.—A final agreement has been reached between the Secretary of State and the German Ambassador for the continuance of the minimum rates of the new German tariff, as applied to American products, and Baron von Sternberg has left for Berlin to submit the agreement to the German Foreign Office. The arrangement is in the nature of a *modus vivendi* extending the application of the minimum schedules for one year from July 1 next.

Outline of the Agreement.

Inaccurate outlines of the agreement have recently been published in the daily press. Although the details of the arrangement are subject to modification until finally ratified by the German Government, and may, therefore, be changed in unimportant respects, the correspondent of *The Iron Age* is in position to state the principal points in the memorandum which the German Ambassador is now conveying to Berlin, as follows:

1. The United States agrees to extend the minor reciprocity treaty negotiated under section 3 of the Dingley act and granting special rates of duty on German argols, brandies, wines, works of art, &c. This treaty was denounced by Germany a year ago, the denunciation to take effect June 30, 1907, the reason for this action being the unwillingness of Germany to concede the entire minimum schedules of her new tariff in exchange for the small number of relatively unimportant items in this treaty, which will now be revived as part of the new understanding.
2. The American Administration pledges itself to endeavor to secure the passage by Congress of the Payne bill amending the customs administrative laws in numerous unimportant particulars. The provisions in this bill of the greatest interest to the German Government are those establishing a margin of 5 per cent. for nonpenalized undervaluations and increasing from 50 to 100 per cent. the limit of undervaluations not involving the seizure of importations.
3. The confirmation of the existing Treasury regulation permitting open hearings in reappraisal cases before the Board of General Appraisers upon the request of the importer, in order that he may be confronted with the witnesses upon whose testimony his goods may be advanced.
4. The withdrawal from Germany of the United States customs secret service, which has co-operated with the staff of appraisers in obtaining accurate foreign market values of the leading lines of merchandise.
5. The confirmation of the departmental regulation under which consuls are now forwarding with proper notations the certificates of chambers of commerce, boards of trade and other commercial bodies of Germany as to prices in usual wholesale quantities of goods offered for shipment to the United States.

The Agreement Will Be Ratified.

Throughout the negotiations the German Ambassador has been in close touch by cable with the Berlin Foreign Office, and there is no doubt that the agreement concluded in Washington will be ratified and promulgated some time before July 1. It will go into force without friction of any kind, and, in point of fact, will make little or no difference in the present customs practice in the United States. The extension of the minor reciprocity treaty with Germany, negotiated under section 3 of the Dingley act, will prevent any change in the treatment of the German products covered thereby after June 30, and American importers of these goods will suffer no inconvenience or loss, as would have been the case had the proposed abrogation of this convention taken effect.

The Administration can take no steps looking to the enactment of the Payne customs administrative bill until Congress meets. Although this measure was on the calendar of the Senate Finance Committee in the last Congress, it died with adjournment, and must be reintroduced in the House in the new Congress and again reported by the Ways and Means Committee. In view of the fact that this ground must be entirely retraced it is altogether probable that the bill will be carefully revised by the Treasury Department, and when again presented will be recognized as in all respects a Government measure. As recently passed by the House it was a composite measure to which contributions had been made by the Treasury Department, the Board of General Appraisers, the Merchants' Association and other commercial

bodies of New York and the members of the Ways and Means Committee.

The present practice with regard to open hearings in reappraisal cases before the Board of General Appraisers will not be changed as the result of the agreement. An order providing for such hearings was tentatively issued by the Treasury Department a year ago and has operated to the entire satisfaction of the Department. Up to the present time not a single controversy with regard to open hearings has been referred to the department, either by customs officials or importers, and in view of the fact that very few such hearings have been held the Treasury officials have reached the conclusion with no little satisfaction that the privilege will rarely be insisted upon by importers. The fact that such hearings can be had upon application, however, has no doubt deterred the customs officials from introducing evidence before the board which it would not care to have made public, and doubtless many witnesses have been prevented from appearing for the Government because of their unwillingness to submit to cross-examination at the hands of the importers and attorneys. The department is not aware of any loss of revenue on this account, however, and no abuses appear to have grown up under the new system.

The Revenues to Be Protected.

The abandonment of the secret customs service in Germany is likely to result merely in a change in the methods to be pursued to obtain foreign market values, for it goes without saying that the Treasury Department must take all necessary steps to inform appraising officers with regard to actual values of merchandise in Germany, as well as in all other foreign countries doing business with the United States. It seems probable that the duties heretofore performed by one or two special agents will hereafter be delegated to the United States Consuls throughout the German Empire, and if this plan is followed it is unlikely that the Federal Government will lose any revenue as the result of the change.

For nearly a year the regulation of the State Department, promulgated at the request of the Secretary of the Treasury, requiring consuls to transmit reports from German chambers of commerce, boards of trade, &c., has been in practical operation and has developed considerable valuable information, especially with reference to so-called consigned goods, which are so often claimed to have no ascertainable foreign market value. Of course these reports have been carefully sifted by the appraising officers and in the future will have no more weight in determining advances than they are entitled to. The data thus far furnished by German commercial bodies have been found to be reliable, and there is every reason to believe that a very conservative policy is being followed in this regard.

Upon the whole the agreement with Germany is highly satisfactory from the standpoint of both governments, and there is reason to believe that the incoming Congress will supplement the departmental regulations provided for by the arrangement in such a manner as to leave nothing more to be desired in the way of administrative amendments. It is not to be assumed that the agitation for the negotiation of a comprehensive reciprocity treaty covering the principal items of the Dingley tariff schedules will cease, but the experience of the past two years indicates that, whether such a convention is ratified or not, there will be no tariff war between Germany and the United States.

W. L. C.

The date for the opening of the national convention of the Iron Molders' Union at Philadelphia has been changed from July 15 to July 22. At the Toronto convention of 1902 there were 519 delegates. This year the number will be 531, although the basis for representation has been doubled.

At the recent International Exposition held at Liege, Belgium, the Armstrong Bros. Tool Company, Chicago, was awarded a medal for the exhibit of its lathe and planer tool holders.

PERSONAL.

Robert Aiken of Toledo, Ohio, has been appointed general superintendent of the Lloyd-Booth foundry of the United Engineering & Foundry Company, Youngstown, Ohio. Since the death of the former superintendent, three years ago, the duties of the office had been looked after by other officials of the company.

The present officers of the Lake Superior Iron Ore Association, Cleveland, are the following: President, Wm. G. Mather, Cleveland-Cliffs Iron Company; vice-president, Frank Billings, Tod, Stambaugh & Co.; treasurer, H. S. Stebbins, Oglebay, Norton & Co.; secretary, Wm. B. Treat.

Frank T. Bentley, traffic manager of the Illinois Steel Company, has been elected president of the Chicago Traffic Club.

Wallace P. Foote, Spring Valley, Wis., has succeeded Robert Miller as superintendent of Missouri Furnace at St. Louis, Mo.

E. T. Murphy has resigned from the B. F. Sturtevant Company's New York branch to accept a position with the Buffalo Forge Company, operating from its branch office in New York. He received his initial training in the blower business with the Buffalo Forge Company at its works in Buffalo and later at its branch in Philadelphia.

J. H. Dohner, for a number of years with the National Cash Register Company, has accepted a position as assistant general superintendent with the National-Acme Mfg. Company, Cleveland, Ohio.

E. H. Lewis, formerly connected with the Genesee Furnace of Corrigan, McKinney & Co., at Charlotte, N. Y., has resigned and is now connected with the Pittsburgh office of the United Iron & Steel Company operating blast furnaces at Leetonia, Ohio, and West Middlesex, Pa.

R. H. Carlisle, of the Strong, Carlisle & Hammond Company, Cleveland, Ohio, machinery and supplies, returned home a few days ago from the Pacific Coast, where he and his family had been touring for 10 weeks. Mr. Carlisle's business associates and employees gave him a very pleasant surprise by gathering at his house in a body.

W. H. Osborne, president of the Wisconsin Malleable Iron Company, Milwaukee, has returned after an extended trip abroad.

Dr. Otto Wuth, Pittsburgh, Pa., announces that on account of his ill health his entire laboratory equipment and the good will of his business have been turned over to Crowell & Murray, 407 Perry-Payne Building, Cleveland, Ohio, chemists, metallurgists and inspecting engineers.

Edward D. Adams has been made chairman of the newly created Finance Committee of the Allis-Chalmers Company. The other members of the committee are Charles Allis, Mark T. Cox, Elbert H. Gary, William A. Read, James Stillman, and Cornelius Vanderbilt. They are all members of the old Executive Committee, which has been reorganized by including in it the members of the various operating departments of the company. Charles Allis is chairman of the Executive Committee. W. H. Whiteside continues as president of the corporation, and Elbert H. Gary as chairman of the Board of Directors.

E. P. Leadbetter, who for the past three years has been connected with the Philadelphia office of the Buffalo Forge Company, and previous to that time was located at its factory office in Buffalo, N. Y., has been appointed manager of the company's Pittsburgh office. C. I. Dean, who until lately has been in charge of the Pittsburgh District, has gone into mining operations in Mexico.

John Simonton, assistant superintendent of the Brown-Bonnell Works of the Republic Iron & Steel Company, Youngstown, Ohio, has resigned, and was presented with a testimonial of esteem by his associates.

P. J. Moran, formerly superintendent of the blast furnaces of the Republic Iron & Steel Company in the

Youngstown District, has resigned to become general superintendent of the two blast furnaces of the United Iron & Steel Company at Leetonia, Ohio, and West Middlesex, Pa.

OBITUARY.

EUGENE GRIFFIN.

Eugene Griffin, first vice-president and manager of the sales department of the General Electric Company, died April 11 at Schenectady, N. Y., from apoplexy, aged 52 years. General Griffin had a long record of army service. He was born in Ellsworth, Maine, and was graduated from West Point in the class of 1875, immediately becoming a second lieutenant in the Engineer Corps of the regular army. In the 14 years which followed he rose to the rank of captain of the corps, filling a number of important assignments. While on Governor's Island in April, 1889, he married a niece of the late General Winfield Scott Hancock. In the following October he resigned his post to engage in business. He was an expert electrical engineer and became connected with the Thomson-Houston Electric Company and later with the British Thomson-Houston Company. The outbreak of the Spanish-American War, however, called him again to service in the army, ranking first as colonel in the First Regiment, United States Volunteer Engineers, which he organized and with which he served in Porto Rico during 1898 and 1899. On January 21, 1899, he was made a brigadier-general of volunteers. He was a member of the Union, University, Army and Navy clubs in New York and several others in Washington, Boston and London. He was a member of the Board of Governors of the Engineers' Club of New York. He was also a member of the American Society of Electrical Engineers. He leaves a widow, a son and a daughter. The son, Hancock Griffin, is connected with the General Electric Company.

RICHARD M. WATTE, chief clerk and assistant to the president of the Colorado Fuel & Iron Company, died at Denver April 7, aged 34 years. If he had lived three days longer he would have been first vice-president of the company. He was ill but a short time. A native of Batavia, N. Y., he went to Kansas City at the age of 16 to seek his fortune, finding employment with the Armour Packing Company. Removing to Colorado, he entered the auditor's office of the Colorado Fuel & Iron Company six years ago and steadily advanced, winning recognition by his ability in systematizing costs. He leaves a widow and a daughter.

JOHN T. KEBLER, general manager of the fuel department of the Colorado Fuel & Iron Company, died at Trinidad, Colo., April 12, from ptomaine poisoning. This makes the seventh death of prominent officials of the company in three years.

Steam Turbines for Lake Freighters.—Harry Coulby, president and general manager of the Pittsburgh Steamship Company, the Steel Corporation's lake vessel subsidiary, who recently returned from England, made inquiry into the development of the steam turbine, with particular relation to its employment on freight carriers. The *Marine Review* says that he found it still in an experimental state so far as low power is concerned. The turbine operating at low speeds consumes as much coal as when operating at higher speeds. There is a saving in oil, but oil consumption on a lake freighter is an inconsiderable item. Mr. Coulby is convinced that the low power triple-expansion engine now in common use on the lakes is the most satisfactory yet devised for moderate speeds, consuming the minimum of fuel and moving its freight at a lower cost per ton per mile than is known anywhere else in the world.

Rapid work is being done on the overhauling of No. 3 blast furnace of the Lackawanna Steel Company, Buffalo, N. Y., which was blown out on April 1, and it is expected it will be put in blast by the end of this month.

Steel Production in Great Britain in 1906.

The British Iron Trade Association has just published statistics showing that the output of open hearth steel ingots and castings in the United Kingdom in 1906 was 4,554,936 gross tons, as compared with 3,838,072 tons in 1905, and 3,245,346 tons in 1904. The increase in 1906 over 1905 was 716,864 tons, the largest in any one year in the history of the open hearth steel industry. The Northeast Coast District leads with a production of 1,338,818 tons, displacing Scotland, which has had first place for a number of years.

The production of basic open hearth steel ingots in 1906 was 1,176,245 tons, an increase of 381,007 tons over 1905. The production of acid open hearth steel was 3,378,691 tons. It thus appears that in Great Britain acid open hearth steel is strongly predominant, while the reverse is true in the United States. The distribution of the British open hearth steel product of 1906, according to the form in which the steel was marketed, is given as follows in gross tons:

	Tons.
Blooms and billets.....	498,656
Plates and angles.....	1,734,446
Steel bars and tin plate bars.....	939,087
Steel rails.....	94,626
Structural shapes.....	198,380
Total.....	3,465,195

The above total leaves 1,089,741 tons of ingots and castings to be accounted for. Of the ingot tonnage a portion is wastage in manufacture, and the remainder is chiefly tires, axles and general forgings. The production of open hearth steel rails fell off, having been 108,953 tons in 1905.

The average number of open hearth furnaces in operation in 1906 was 419. The total number of furnaces in Great Britain in the spring of 1906 was 514. The total average output of ingots per furnace in operation was 10,871 tons in 1906, and 10,130 tons in 1905. Of the furnaces in operation last year, 331 made acid steel and 88 made basic steel. Eighteen new furnaces were being built at the close of 1906, all but one being for the acid process. Only one works had an output in excess of 300,000 tons of open hearth steel in 1906; two had outputs between 200,000 and 300,000 tons; 13 had outputs between 100,000 and 200,000 tons and 22 produced between 50,000 and 100,000 tons each.

Bessemer Steel Production.

The production of Bessemer steel ingots in Great Britain in 1906 was 1,907,338 tons, against 1,974,210 tons in 1905, 1,781,533 tons in 1904, and 1,910,018 tons in 1903. These figures do not include the output of a number of special converters used in Sheffield, the total of which is estimated at not over 30,000 tons. The Bessemer steel output of 1906 was exceeded in 1890 as well as in 1903 and 1905. The output of acid Bessemer ingots in 1906 was 1,307,149 tons, or 89,084 tons less than in 1905, while the output of basic Bessemer ingots was 600,189 tons, or 22,212 tons more than in 1905.

The output of Bessemer rails in 1906 was 854,740 tons, against 951,552 tons in 1905, 916,374 tons in 1904, and 1,061,441 tons in 1903. The distribution of Bessemer products so far as indicated is as follows, in gross tons:

Rails	854,740
Bars	242,706
Blooms and billets.....	277,845
Merchant steel.....	82,246
Shapes, rounds, squares, flats, &c.....	162,650
Total.....	1,620,187

The above total falls short of the ingots produced by 287,151 tons, which it is stated represents loss in conversion, also the unascertained output of fish plates, sheets, plates and other products of small tonnage.

The number of Bessemer converters in operation in the United Kingdom in 1906 averaged slightly over 56, while the inactive converters averaged slightly under 12. Of the 18 different works producing Bessemer steel in 1906, four produced between 100,000 and 200,000 tons each, while only one produced over 200,000 tons.

The above figures show that the total of Bessemer

and open hearth steel production in Great Britain in 1906, including about 30,000, the estimated production of small converters in Sheffield, was 6,492,274 gross tons, as compared with 23,246,251 tons in the United States.

Labor Notes.

Reports that a strike had occurred at the plant of the Colonial Steel Company, Colonial, Pa., are untrue. Only four engineers were concerned, and they went back to work the day after going out on strike.

San Francisco advices state that after four or five years of comparative peace since the settlement of the machinists' strike for eight hours, which lasted 10 months and resulted in a nine-hour day in the local iron working establishments, the thoroughly unionized men in the metal trades claim to be ready for another struggle. They say they will strike May 1 for eight hours, even if it results in their receiving less in wages for a day's work. While a number of the smaller shops may yield at once, it is reported that the three big plants of the city, which carry on large engineering and shipbuilding works, will refuse to make any concessions in hours. They say that they are paying higher wages than prevail in the East, and that if the working day is shortened they can no longer compete with the Eastern manufactories in their lines. The unions assert in reply that 60 per cent. of the work done by the local iron works is repair work on which Eastern concerns cannot compete. The management of the Union Iron Works has given out a statement to the effect that it has lost \$1,000,000 on the three large cruisers which are nearly completed for the Government, on account of the advances in wages since the contracts were figured on. It is asserted that no more Government work will be undertaken here, and that about half of the men will be discharged this summer on the completion of the Government work in hand. The men say that most of them can get better jobs with other firms, and that they will leave before summer. The Union Iron Works employs over 3000 men, the Risdon Iron Works nearly 2000 and the Fulton Iron Works about 800. The fact that there is such a great demand for labor of nearly every kind all over the Coast makes the workmen feel very independent.

The Massachusetts Legislature has disposed of its labor bills, including those pertaining to picketing, anti-injunction and employers' liability, by referring them all to a Recess Committee, which has instructions to make a thorough investigation of the matters involved and report results to the next Legislature.

At Indianapolis, Ind., in the injunction suit of the Pope Motor Car Company against the Machinists' Union the court instructed the United States Marshal that if the union failed to pay the court costs, amounting to \$800, before April 20, to sell property, real and personal, valued at \$3,000, owned by several union machinists and already levied upon.

A Dover, N. J., dispatch says that as the result of a strike the laborers employed by the Richardson & Boynton Company's stove works last week the plant was closed on April 13 and over 600 employees were paid off. The laborers were receiving \$1.82 for a 10-hr. day and demanded \$2 for a 9-hr. day. They also asked for the discharge of the foreman.

Two steam turbine fireboats for the city of New York were launched April 16 at the yards of Alexander Miller & Bro., Newburgh, N. Y. They will be similar in construction, the length on deck being 131 ft., breadth of hull 27 ft., and depth 14 ft. The engines will be of the turbine pattern of 830 hp. The pumps, of the new centrifugal pattern, will be driven directly by turbines, and each will have a capacity of 10,000 gal. of water per minute. There are to be no obstructions on the decks, which are to be flush and always clear for action. The only objects on deck will be the pilot house forward, the water tower aft and the two turrets for hose connection. There will be nine 3½-in. hose connections in each turret.

Trade Publications.

Recorders and Gauges.—Crosby Steam Gauge and Valve Company, 16 Dey street, New York. Leaflet. Deals with the Crosby pressure recorder, pressure recorder and gauge, and gas, mine and draft recorder.

Valves and Packing.—Ideal Metallic Packing Company, St. Paul, Minn. Circulars. One deals with the R-C blow-off valve, which is heavily and strongly constructed with a heavy cast iron body and malleable cast lever and disk holder. The other pertains to Ideal metallic packing for stuffing boxes of piston rods, valve rods, plungers and other reciprocating or rotating parts of machines requiring packing. Testimonials relating to these valves and packing are given.

Wire Nail Machinery.—National Machinery Company, Tiffin, Ohio. Bulletin No. 30. Gives an illustrated description of the National wire nail machines, which are made in seven sizes and are capable of producing nails from $\frac{1}{4}$ to 12 in. long. The capacity per hour of the maximum sizes ranges from 30 to 3000 lb. The nails are made cold from coiled steel wire, one being completed at each revolution of the machine. Illustrations are also given of the company's double bolt cutter, continuous rivet machine, hot pressed nut machine and bolt heading machine.

Pinions and Gears.—The New Process Raw Hide Company, 500 Plum street, Syracuse, N. Y. Catalogue. Size $3\frac{1}{2} \times 5\frac{1}{4}$ in.; pages 86. Contains views of the company's new factory and hide plant, illustrations of most of the different styles of gears and pinions manufactured, and interesting information concerning the methods for treating the hide for the gears. It also indicates the various applications of the gears and their strength, lists complete gears and finished blanks for customers desiring to cut the teeth themselves, metal gears, raw hide washers, vulcanized fiber gears, metal flanges, bushings, raw hide capped mallets, &c. A list of some prominent users of New Process pinions are included.

Recording Gauges.—The Bristol Company, Waterbury, Conn. Catalogue and bulletin. Catalogue No. 44, superseding No. 13. Size 8 x 11 in.; pages 28; contains illustrations and descriptions of the Bristol standard form recording gauges for pressure, vacuum and combination pressure and vacuum; Bristol portable recording gauges, and Bristol round recording gauges for pressures exceeding 3 lb. per square inch. A table with code words and catalogue numbers lists the full line of gauges for various working ranges and length of time elapsed in the taking of a record. Specimen sections of standard charts identify the complete line, giving the numbers by which they may be ordered. A few specialties are shown in the back of the book, including recording instrument ink, a horizontal and a vertical file chart cabinet, a protecting case for use in protecting the recorder from dust, injurious atmosphere, &c., and recording gauge oil seals. Bulletin No. 29 deals briefly with Bristol recording instruments for pressure, temperature and electricity. Two circulars are devoted respectively to Bristol standard recording water level gauges, and patent steel belt lacing.

Concrete Reinforcement.—General Fireproofing Company, Youngstown, Ohio. Circular. This treats of the cold twisted lug bar, which is claimed to be a perfect bond in concrete. The lugs are staggered, insuring an ample and solid backing and preventing slipping. The bar is claimed to leave no sharp, square corners in the concrete which would start cracks.

Drills.—American Diamond Rock Drill Company, 95 Liberty street, New York City. Catalogue No. 26. Size 6 x 9 in.; pages 86. Entitled "The Diamond Drill and Its Work." Describes the diamond core drills manufactured by this company, including records of performances of the drills which are of special interest to engineers and contractors. There is included a brief description of the kinds of diamonds used and the process of mining them, and also a general description of drills and special features. Numerous illustrations are given of the different types, and others show them in operation in various localities. Tables of prices, shipping weights, duplicate parts, &c., are appended.

Emery and Corundum Wheels.—The Abrasive Material Company, Paschall, Philadelphia. Catalogue. Size 6 x 9 in.; pages 68. Illustrates and describes a line of emery and corundum wheels, including abrasive grinding wheels, silicate wheels, cup wheels and cylinder wheels. Sectional views and list prices are given of special wheels for the grinding machinery manufactured by the Landis Tool Company, Brown & Sharpe Mfg. Company, Springfield Mfg. Company, Diamond Machine Company and the Universal Machine Company, also special wheels for the Cincinnati cutter and tool grinder, Wells Bros. universal cutter grinder, and for various other machine tools.

Ice and Refrigeration Machinery.—Gillette Ice Machine Company, 346 Broadway, New York City. Catalogue. Deals with the Gillette ice and refrigeration machinery, by which it is claimed ice can be manufactured at less than \$1 per ton. The machines are not only adapted for making ice, but also for cooling purposes in such places as country homes,

hotels, apartment houses, pleasure yachts, steamships, restaurants, &c.

Foundry Ladles.—J. W. Paxson Company, Philadelphia, Pa. Bulletin No. 14. Illustrates a variety of foundry ladles of various sizes and types that are furnished in any combination of gearing, ball or lips, of which tables of prices, capacities and weights are given. Lead and Babbitt melting furnaces, the Paxson-Colliau cupola, Paxson-Green and Paxson-Champion pressure blowers, exhaust rumblers, cylinder mill and Monarch ashes grinder and separator are also dealt with.

Gas-Composimeter.—Uehling Instrument Company, Passaic, N. J. Pamphlet. Pertains to the Uehling gas-composimeter, an instrument that, giving a quantitative analysis of the flue gases, enables the fireman to see at all times how efficiently the furnace is being fired and also provides the superintendent or chief engineer with a continuous record which is a check on the fireman's work.

Machinery.—Arlington Machine Works, Arlington Heights, Mass. Loose leaf catalogue. Gives an illustrated description of the company's line of machinery suitable for bleach works, print works, dye works and general finishing establishments for cottons and woollens. These include sewing, brushing and moting and washing machines, squeezers, scrutchers, openers and folders, angular and spiral rollers, stretchers, mangles, calendars, folding and plaiting machines, reels, dye jigs, soapers and washers, pot eyes, drying cans, vacuum strainers, expanding pulleys, yarn assorting balances, saturating machines, bleaching kiers, bleachers, washers, dampening, batching, dyeing, warp sizing and rolling machines.

Gasoline Treating Compound.—Barrett-Palmer Company, New York City. Pamphlets and circulars. Give information and testimonials regarding "alchemo," a chemical compound which, it is claimed, when introduced into gasoline to be used as fuel in a motor so alters its character as to produce increased power and changes the products of combustion as to prevent carbonization of the motor parts. The pamphlet states that the introduction of the compound into raw gasoline increases the factor of safety from accidental explosion by confining the dangerous gases within the liquid. The pamphlet contains authoritative testimonial letters from the Electric Boat Company, Lewis Nixon and others, and the circulars include details of tests.

Engines.—Western Gas Engine Company, 908 North Main street, Los Angeles, Cal. Catalogue C. Size 6 x 9 in.; pages 62. Descriptive of the Western gas engines, designed for all power purposes and operated by either distillate, naphtha, gasoline or alcohol, or manufactured, natural or producer gas. Construction details and the mechanical operation of the engines are explained, and tables of dimensions, weights, &c., are given of the single and double cylinder types. Testimonials, photographs of various installations and several pages of useful information are included. The Western hoists, made in sizes ranging from 7 to 90 hp., and portable outfits mounted on steel trucks, made in sizes from 7 to 60 hp., are also described.

Motors.—The Emerson Electric Mfg. Company, St. Louis, Mo. Bulletins. No. 3252, superseding No. 3251, pertains to multipolar inclosed motors for direct current, made in sizes of from $\frac{1}{4}$ to 2 hp. Photographs show these motors as installed in a job printing office. Code words, data and list prices are given in tabulated form. Bulletin No. 3903 is devoted to alternating and direct current factory sewing machine motors. These motors have fully inclosed frames and are equipped with automatic brakes.

Emery Wheels and Grinding Machinery.—Bridgeport Safety Emery Wheel Company, Bridgeport, Conn. 1907 catalogue. Size 6 x 9 in.; pages 95. Illustrates and describes a line of emery wheels and grinding and polishing machinery, including emery wheels of all shapes, grades and sizes; tool grinders, drop apron tool grinders, combination wet and dry grinders, self-oiling cast iron split bearings, bench grinders, floor grinders; phosphor-bronze, removable, split-sleeve, ring-oiling bearings; direct and alternating current, direct connected motor driven wet and dry grinders; bench, floor and overhanging buffing lathes; knife grinders of various sizes, including those with guide bars and cup wheels; swing frame grinders, slitter and disk grinders, gun barrel grinders, &c. Telegraph and cable codes and a complete index are appended.

Feed Water Heater and Purifier.—Pittsburgh Feed Water Heater Company, Frick Building, Pittsburgh, Pa. 1907 catalogue. Size 6 x 9 in.; pages 64. Presents the details of the Pittsburgh feed water heaters and purifiers, comprising the open and closed tubular types, and also the combined heater and receiver. Several illustrations of installations of these are given together with a partial list of users and numerous testimonials. Short descriptions are included of the Bonar gauge cock, Bonar oil filter separator and purifier and the Bonar class B oil filter.

Oil and Grease Cups.—D. T. Williams Valve Company, Cincinnati, Ohio. Advance circular. Illustrates, describes and lists the company's line of oil and grease cups, which are made in a large variety of styles to meet the requirements of almost any conceivable service. It also calls attention to the new 1907 and 1908 catalogue, which is now on the press and will be ready for distribution about May 1, requests for which are invited.

NEWS OF THE WORKS.

Iron and Steel.

At the annual meeting of the stockholders of the Passaic Steel Company, held at Paterson, N. J., April 2, F. C. Reinhardt was re-elected president, John R. Lee was made vice-president and J. B. Cooke secretary and treasurer. The office of vice-president is newly created. The following were chosen directors: W. A. Arnold, T. H. Conderman, O. W. Cooke, J. B. Cooke, John F. Dolan, B. H. Focht, A. H. Hopper, John R. Lee, George MacDonald, Herman Osthaus, Franz C. Reinhardt, Charles Simon, James Simpson, Joseph Wadsworth, A. T. Wright. It is stated that the company has good orders on hand, with the prospect of full operation of the mills through the coming summer.

George W. Prentiss & Co., Holyoke, Mass., wire manufacturers, will increase the capacity of their works by raising the roof of the main building one story, adding about 7000 sq. ft. of floor space, which will be used principally for storage purposes.

Preparations are being made to put in blast the old charcoal iron furnace located at Choccolay, near Marquette, Mich., and last active in 1891. The furnace will be operated by the Northern Charcoal Iron Company, which was recently organized. The Berry interests of Detroit, already operating charcoal furnaces at Manistique and Newberry, Mich., are connected with the new enterprise. Repairs are being made under the direction of E. E. Johnston, manager of the Michigan Iron Company's furnace at Newberry. Choccolay Furnace was formerly owned by the Northern Furnace Company. The stack is 50 x 10½ ft., was built in 1860 and rebuilt in 1890. Its capacity was about 25,000 tons a year.

The Compressed Steel Shafting Company, Boston, Mass., in connection with its regular business of making cold rolled shafting and shapes, has effected means for finishing all the various carbon steels and charcoal and Norway iron, of plain and intricate shapes, to exact sizes, bright and accurate, for special machinery and automobile builders, obviating the necessity of turning and fitting such shapes for use.

Work on the plant of the New York State Steel Company at Buffalo, which has been in progress for over a year, is practically completed and the company will begin manufacturing the latter part of this week. The first work will be on steel billets. The portion of the plant ready for operation contains two 200-ton Talbot open hearth furnaces, with auxiliary equipment, gas producers, melting cupolas, serving machinery and a 36-in. blooming mill, with auxiliary equipment, boilers and power plant. The company's property comprises 27 acres fronting the Buffalo River, with ample railroad connections, the total investment approximating \$7,500,000.

One of the Isabella furnaces of the Carnegie Steel Company, Pittsburgh, has been blown out for relining and repairs.

The American Sheet & Tin Plate Company is rebuilding the burned portion of its Monongahela Works on the South Side, Pittsburgh.

The new 10-in. skelp mill built by the Youngstown Sheet & Tube Company, Youngstown, Ohio, has been completed and was started this week.

Vollkommer & Co., engineers and contractors, Empire Building, Pittsburgh, have been awarded a contract for a cold rolling mill building for the Interstate Steel Company, Brackenridge, Pa., to be of steel construction, 65 x 200 ft., and to be equipped with a 10-ton crane.

Atlantic Furnace of Republic Iron & Steel Company at New Castle, Pa., which has been shut down since last August for relining and extensive repairs, was blown in last week. The capacity of the furnace has been considerably increased.

The Crucible Steel Company of America, Pittsburgh, has sold the plant, formerly known as the Beaver Falls Steel Company, at Beaver Falls, Pa., which was closed after the Crucible Steel Company was organized.

Vollkommer & Hagan, engineers and contractors, Empire Building, Pittsburgh, have secured a contract to build two melting furnaces, one muffle furnace and one annealing furnace for the Pressed Steel Sanitary Mfg. Company, Detroit, Mich. The firm has about finished work on the new plant of the Pittsburgh Sanitary Mfg. Company, Coraopolis, Pa., while the welding and annealing furnaces which are being erected at the McCullough Iron Company's plant at Wilmington, Del., will be shipped this week.

The Porter-Miller Engineering Company, Pittsburgh, has been awarded a contract to reline the two blast furnaces of the Algoma Steel Company, Sault Ste. Marie, Canada. These furnaces each have a capacity of 200 tons daily. The contract for the fire brick has been given to the Harbison-Walker Refractories Company, Pittsburgh.

The departments of the Struthers Works of the American Sheet & Tin Plate Company at Struthers, Ohio, which have been closed down owing to a broken engine shaft, were started up on Monday, April 15, and the entire plant, which contains six hot sheet mills with a capacity of 360 tons per week, is now in full operation.

Reports that the United Iron & Steel Company, Pittsburgh, which operates blast furnaces at Leetonia, Ohio, and West Middlesex, Pa., would build a steel plant at the latter place are officially denied. The project has not been considered in any way.

The plate mill of the Potts Brothers' Iron Works, Pottstown, Pa., which was badly damaged by fire some time ago, will resume operations about May 1.

General Machinery.

The Howe Scale Company of Illinois, successor to the Borden & Selleck Company, will shortly move into a new building at 1315-1325 Wabash avenue, Chicago, designed especially to meet the requirements of its business. The company is general Western sales agent for the products of the Howe Scale Company, and also manufactures coal handling machinery. The new building, which is 87 x 171 ft., is arranged to provide special facilities for the manufacturing end of the business. It includes a complete engineering and drafting department, and in connection with the company's shops at Rutland, Vt., is furnished with ample equipment for turning out coal and ash handling machinery for any sized plant. Special conveying machinery for the rapid and economical handling of all kinds of material is also included in the line of the company's products.

John H. Murphy, New Orleans, La., is making a number of improvements to his iron works which, when completed, will place the plant among the largest in the South. The space formerly occupied by the machine shop is being made three stories high, to conform with the building on Magazine street, and when completed the works will be three stories high, fronting on Magazine, Girard and Capteville streets. The machine shop will occupy the first floor, with traveling crane in the center, which will also reach the erecting floor, and the upper floors will be used to accommodate stock and for the erection of lighter machinery. The rear of the building will be occupied by the copper shop and brass foundry. Mr. Murphy also owns one of the largest boiler works south of the Ohio River, which is located on Broad and Poydras streets, and which is equipped with modern tools for the manufacture of boilers, hydraulic riveting machines and pneumatic tools. In addition to the line of manufacture, engines, pumps, pipe fittings and general mill supplies are carried in stock.

The Fort Worth & Denver City Railroad has awarded contract for the construction of a new shop, 120 x 248 ft., to cost \$56,000, and a 125-ft. transfer table, to cost \$10,000. In addition \$3500 will be spent on improvements to the old shop, and machinery valued at \$40,000 will be installed. The mechanical requirements have been arranged for.

Plans have been completed for the new plant to be erected by the Clyde Iron Works, Duluth, Minn. The plant will consist of a machine shop, 90 x 140 ft.; foundry, 90 x 180 ft.; blacksmith shop, 50 x 200 ft.; pattern shop, 90 ft. square; tool shop, 50 x 80 ft., and a two-story warehouse, 70 x 90 ft. The buildings will be of mill construction and one story, with the exception of the warehouse.

The W. T. Adams Machine Company, Corinth, Miss., whose works were burned some time ago, have rebuilt on a larger scale. The machine shop is 70 x 400 ft. and foundry 60 x 200 ft., both being supplied with overhead cranes. Electric power is developed to operate the machinery and for lighting purposes. The capacity is fully 50 per cent. over that of the old plant, and orders now in hand will keep it running six months.

The Bayside Iron Works, Everett, Wash., will rebuild the part of its plant which was recently destroyed by fire, the machinery for which has already been bought and temporarily installed in an adjacent building. The company manufactures marine, mill and mining machinery, iron and brass castings.

The Carnegie Mfg. Company has been organized to erect and equip a forging plant at Carnegie, Pa. Application has been made for a charter, the incorporators being Stephen Stone, T. C. Graham and George P. Steel.

The Whiteside Leader & Machinery Company has been incorporated at Indianapolis, Ind., with \$50,000 capital stock, to deal in patented machinery for grading, hauling, excavating, &c. The directors are Sidney B. Whiteside, Henry C. Churchman and Omer U. Newman.

Power Plant Equipment.

The Wisconsin Engine Company, Frick Building, Pittsburgh, is furnishing the American Sheet & Tin Plate Company with a 32 x 56 x 60 in. tandem compound engine for running the new sheet mills at Vandergrift, and two cross compound engines to the Jones & Laughlin Steel Company to run a 600-kw. generator to be installed at the new plant at Aliquippa. The company is also building a large engine for the Crucible Steel Company of America.

The Davis Sales Company has been incorporated at Indianapolis, Ind., with \$10,000 capital stock, to deal in boiler and engine supplies, &c. The directors are Edgar L. Davis, J. H. Pearson and J. E. Neighbor.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., is pushing the construction of its new building at East Pittsburgh with the utmost speed, and it is expected to be ready for

occupancy before August. With its completion the company will be in a position to use a considerable amount of available space in the old shops, it being the intention to utilize the entire eight stories of the new building for the construction of detail apparatus, which is now made in the main shops. Recent orders include the Spokane & Inland Empire Railroad, Spokane, Wash., eight 72-ton single phase electric locomotives; Ohio Valley Finance Company, Steubenville, Ohio, power house equipment, including three 100-hp. steam turbines, three electric generators of corresponding capacity, rotary converters, switchboard apparatus, &c.; Brooklyn Rapid Transit Company, Brooklyn, N. Y., 200 motors of 200 hp. each, for the equipment of 100 elevated cars; Atlantic Coast Electric Railway Company, three 750-hp. steam turbines, three 750-hp. electric generators and switchboard appliances.

The Casey & Hedges Mfg. Company, Chattanooga, Tenn., intends to enlarge its plant.

The Shamokin & Coal Township Light & Power Company, Shamokin, Pa., has increased its capital stock from \$90,000 to \$180,000, the increased capital to be used in doubling the capacity of its modern plant. Contracts for the improvements will be immediately closed and will cover an extension to the building and the installation of a 100-kw. Westinghouse-Parsons turbo generator, Alberger condenser, 300-hp. Babcock & Wilcox boiler, boiler feed pumps, remodeling switchboard and other approved apparatus for recording and delivering the output. J. A. Britton is superintendent.

The J. D. Connell Iron Works Company, New Orleans, La., has purchased the old established foundry of Joseph Sutton, which it will improve by installing traveling cranes and other modern equipment. This will double the former capacity and also furnish space for further expansion. The boiler and sheet metal departments will be increased 50 per cent.

Foundries.

The Christy Steel Company has been incorporated in Akron, Ohio, with a capital stock of \$50,000, for the manufacture of crucible steel castings. The company was formed to enlarge the business that has been conducted by James Christy. A foundry 80 x 130 ft. is being erected, which will have an output of from 3 to 5 tons per day. The equipment has already been arranged for. The company expects to be operating the new plant about July 1. The officers of the company are James Christy, president; F. D. Kidder, vice-president; James W. Orr, treasurer and general manager; A. K. Kronk, secretary, and Frank W. Reiske, superintendent.

The Standard Foundry, Worcester, Mass., is to build an addition 28 x 60 ft., to be devoted to molding.

The Barry & Zecher Company, Lancaster, Pa., has increased its capital stock from \$13,000 to \$25,000, to enlarge its foundry.

The Nute Foundry Company has let a contract for the building of a new foundry at Cuyahoga Falls, Ohio, and when completed its present foundry at Akron, Ohio, will be moved to the new location.

The Vincennes Pipe & Castings Company has been organized at Vincennes, Ind., with a capital stock of \$50,000, to manufacture pipe, castings, fittings, &c. The directors are John D. La Croix, Cornelius F. Posson, Wm. J. Nicholson and Chas. L. Rundle.

The Ohio Steel Foundry Company has commenced the construction of a new plant at Lima, Ohio. The main building will be 167 x 300 ft.; power house, 50 x 80 ft.; pattern shop, 50 x 56 ft., and the pattern storage building, 60 x 150 ft. The plant will be modern in every respect. The machinery will be electrically driven.

The Ravenna Furnace & Heating Company, Ravenna, Ohio, which was recently reorganized, has purchased a site and will soon begin the erection of a foundry building about 80 x 100 ft. The company will engage in the manufacture of furnaces.

W. P. Skeen has sold his foundry at Greensburg, Ind., to Wilfrid Hilland of Chicago and the latter has taken charge.

The Chicago Steel Foundry Company, Nineteenth and Rockwell streets, Chicago, organized some months ago, has just completed and put in operation a plant for the manufacture of high grade crucible steel castings. A specialty will be made of small steel castings, ranging from 1 to 150 lb., suitable for automobile parts. The operation of the plant is in charge of David McLain, and David Evans & Co., Rookery Building, Chicago, are sole selling agents.

The Appleton Mfg. Company, Batavia, Ill., manufacturer of agricultural implements, which recently enlarged its plant, adding 34,400 sq. ft. of floor space, is now building an addition to its foundry which will practically double the space occupied by that department.

The Reed Mfg. Company, Kalamazoo, Mich., is closing out its implement business and converting its plant into a foundry for the manufacture of high grade crucible steel castings. The company will be ready to start molding about May 1, and will make a specialty of gears and automobile work.

The Maryland Car Wheel Works, Baltimore, Md., intends to rebuild its plant which was recently destroyed by fire. The orders for the required machinery have been placed.

The Keystone Steel Casting Company, Chester, Pa., whose temporary offices are at 39 and 40 Cambridge Building, has let contract for the construction of its plant, and will place orders for machine tool equipment within a few days. The plant will consist of a main foundry building, 82 x 200 ft.; annealing building, 60 x 100 ft.; power house and machine shop, 40 x 80 ft.; cupola building, pattern shop and office.

Bridges and Buildings.

The structural steel fabrication plant of the Llewellyn Iron Works, Incorporated, Los Angeles, Cal., has been enlarged by a 500 ft. extension to the main building. New tools for the fabrication and handling of structural and sheet steel, including three 10-ton electric traveling cranes, have been installed.

A contract for the erection of a steel bridge over the Illinois River at Utica, Ill., has been secured by the Decatur Bridge Company, Decatur, Ill. The bridge will consist of one 300-ft. draw span and a 150-ft. stationary span. The company has also secured a contract for a seven-story steel frame building at Danville, Ill., which will require about 400 tons of structural material, orders for which have already been placed.

The McClintic-Marshall Construction Company, Pittsburgh, has received an order from the Keith Car Company, Boston, Mass., for the erection of a steel building 60 x 1400 ft., which will require about 700 tons of steel.

With the exception of possibly two punching machines, W. N. Kratzer & Co., Pittsburgh, Pa., manufacturers of structural steel and iron work, have secured all the machinery they will require for equipping their new girder and column shop, 45 x 120 ft. The machinery already purchased includes riveting machines, shears, angle shears, electric traveling crane, trolleys, punching machine, &c. The other building, 60 x 120 ft., the company has in course of erection is simply to inclose the machinery and materials now on hand.

Motors and Small Engines.

The Reading Oil & Gas Engine Company, Reading, Pa., has bought a 5-acre tract near that city, upon which it will build a model engine plant. It now operates a plant in Reading, but is compelled to expand because of increasing business.

Fires.

Several buildings of the Jeremiah Clark Machinery Company, Lowell, Mass., were damaged by fire April 14, the loss being about \$20,000.

Hardware.

Extensive additions to the plant of the Trahern Pump Company, Rockford, Ill., have been planned, which when completed will practically double its present capacity. Plans for these improvements, which will include the installation of new machinery, are practically completed, and will be ready for execution within a short time. A steady growth in business has made an increase of the company's output an imperative necessity.

The Ayer Mfg. Company, Keokuk, Iowa, has purchased the machinery of the Clark Mfg. Company, Moline, Ill., maker of disk sharpeners, stock waterers, &c., and has removed it to Keokuk, where the Ayer Company will make these goods in connection with its other lines.

The Metal Goods Mfg. Company has been formed in Palmsville, Ohio, with a capital of \$25,000, and has commenced the manufacture of metal bindings and hardware specialties. The incorporators are Max E. Meisel, R. Hitchcock, E. C. Mullen, D. E. Morgan and Fred F. Truhlar.

The McKay Patent Turpentine Cup Company, Hibernia Building, New Orleans, La., which has heretofore had its turpentine cup made by other parties, is about to erect its own plant. The plant will consist of two buildings, each 75 x 140 ft. This patent cup does away with the necessity of wounding the tree in drawing the sap or gum, and is also a receptacle for it.

The recent flood at Pittsburgh delayed work on the additions which the Graham Nut Company is making to its works at Neville Island, Pittsburgh, but it is expected to have all the new equipment installed and the addition in operation by July, at which time the output, which consists of nuts, bolts, rivets, washers, &c., will be doubled.

The New Haven Machine Screw Company, New Haven, Conn., has established a factory and began business April 1, manufacturing screw machine products turned from steel, iron and brass, and special and standard screws. The company is equipped to do a general line of machine and tool work. J. J. Reidy, the general manager, was for 17 years with Reynolds & Co., New Haven, and P. J. Ring, the superintendent, has had wide experience with the same firm and with other screw manufacturers. The company has taken a five years' lease of the factory at Mill street and Saltonstall avenue.

The Wm. Schollhorn Company, New Haven, Conn., manufacturer of Bernard's patent pliers, nippers, punches, &c., is installing new machinery as rapidly as it can get deliveries in the large addition to the factory which was recently completed. The company now occupies nearly 60,000 sq. ft. of floor space and is enlarging its line. Business continues in large volume, orders received so far this year exceeding in volume that of the corresponding period of 1906.

The Plymouth Cordage Company, Plymouth, Mass., is erecting a new building, to be known as No. 3 mill, which will be

80 x 530 ft. and three stories. It is being constructed of cement brick made on the premises. The building will be devoted to the manufacture of rope.

The Buffalo Glove & Whip Manufactory, 775-781 Seneca street, Buffalo, N. Y., has enlarged its whip plant and is now in position to take prompt care of all orders. During the past year the old machinery in the glove plant was all discarded and an entirely new equipment installed.

Miscellaneous.

The Hydraulic Pressed Steel Company, which recently began operations, has started the erection of an assembling room adjoining its factory on East Sixty-first street. The building will be about 50 x 160 ft. and one story high. The company has just installed some new shears and punches and has more under order. The company is rushed with orders for automobile and bicycle parts.

The Skinner Chuck Company, New Britain, Conn., is to install a 15 x 36 in. horizontal steam engine, contract for which has just been placed with the C. H. Brown Engine Company, Fitchburg, Mass. The power house was completed so far as equipping it with boiler in December of last year. The engine will complete the equipment with the possible exception of a further increase in boiler capacity as the need shall demand it. The company has also largely increased its equipment of lathes, milling machines and planers during the past few months, and other equipment has been ordered which is not yet delivered. The company reports that gear cutters are among the hardest machines to obtain in the market. Business continues unabated with this company.

The Pacific Metal Works has purchased a quarter of a block of land at the northwest corner of Park and Everett streets in Portland, Ore., which will be entirely covered by a new factory building.

A. R. Walmsley has purchased the good will, together with the patterns and drawings, of Geo. Hill & Co., electrical and tramway engineers, Trafford Electrical Works, Manchester, England. J. H. Edwards, the late manager, has been retained and the business will be carried on under the same title and at the same address.

The Pittsburgh Gage & Supply Company, Pittsburgh, has recently installed White Star oiling systems in the engine rooms of the Cincinnati Water Works, Cincinnati, Ohio; Standard Underground Cable Company, Perth Amboy, N. J.; Warner & Swasey Company, Cleveland, Ohio; Baldwin Steel Company, Charleston, W. Va.; New River & Pocahontas Coal Company, Berwind, W. Va.; Berwind-White Coal Mining Company, Windber, Pa.; John Wanamaker, New York; Pittsfield Electric Street Railroad, Pittsfield, Mass.; John Roebling Sons Company, Kinkora, N. J.; Bryan-Marsh Electric Company, Central Falls, R. I.; Louisville Lighting Company, Louisville, Ky. This modern method of lubricating engine bearings is fully illustrated and described in a new catalogue published by the company.

The American Tubular Axle Company, Toledo, Ohio, has purchased the adjoining property of the Great Western Pn Company. The buildings on the property will be remodeled and new ones erected to largely increase the capacity of the axle company's plant.

The H & H Dry Battery Company has been organized at South Bend, Ind., with \$25,000 capital stock, to manufacture and sell automobile supplies, batteries, &c. The directors are Floyd B. Hornbeck, Leon F. Freygang and Theodore Thorward.

The Platinum Ignitor Company has been incorporated at Indianapolis, Ind., with \$20,000 capital stock, to manufacture lighters of brass, wire and platinum, &c. The directors are Edgar H. Williams, Aubrey D. Porter and Thos. G. Dearth.

The Roeder Vehicle Fender Company has been incorporated at Buffalo, N. Y., with a capital stock of \$50,000, to manufacture the Roeder patent fender for automobiles, cars, &c., and will at once erect and equip a factory. Anthony Roeder, Broadway and Spruce street, is to be manager.

The United States Steel Corporation has placed orders for 200 all steel box cars to be used for carrying cement. The object in placing the order was to demonstrate the adaptability of steel cars for carrying cement, rather than for any advantage that will accrue to the company of owning private cars.

The Youngstown Car Mfg. Company, Youngstown, Ohio, has recently booked orders for 100 mining cars, 75 small steel cars for the American Steel & Wire Company, 6 steel cars of 40,000 lb. capacity for the National Tube Company and 25 platform cars for the Fairbanks Company of Pittsburgh. The company has sufficient orders on its books to cover its output for about six months.

The John B. Higbee Glass Company, Pittsburgh, has bought a site of 11 acres at Bridgeville, Pa., on which it will erect a glass plant for the manufacture of table ware. The property has a frontage of 780 ft. on the Pittsburgh, Cincinnati, Chicago & St. Louis Railroad, together with Wabash connections. Contract for a steel building 130 x 180 ft., aggregating 400 tons, has been awarded to the Fort Pitt Bridge Works, Pittsburgh. The plant will contain two furnaces of 12 pots each, six annealing lehrs, together with pot arches, glory holes and mold ovens,

which will be furnished by the H. L. Dixon Company, Pittsburgh. The plant will cost about \$100,000 and will be in operation about August 15. The H. L. Dixon Company has also been awarded a contract for the erection of a new bottle factory at Salem, Va. The parties behind the project are connected with the Catawba Valley Railway & Mining Company. construction work will be started as soon as possible, but the factory will not be in shape for glass making before the beginning of next blast.

The Eureka Pump Company has been incorporated at Marion, Ind., with \$10,000 capital stock, to manufacture a self-measuring pump for coal oil, gasoline, &c. The directors are G. A. Thomas, F. I. Thomas, F. H. Whitcomb, George Ragan and W. C. Black.

The American Brass & Aluminum Works, Indianapolis, Ind., has increased its capital stock from \$10,000 to \$30,000. G. R. Stewart is president and Frank E. Janes secretary.

The Engineering Societies Building Dedicated.

The formal dedication of the Engineering Societies Building, New York, took place on Tuesday and Wednesday of this week. The programme, as printed in *The Iron Age* of April 4, page 1060, was carried out in full. The exercises on Tuesday were especially interesting. The auditorium was filled with a most distinguished gathering of engineers and representatives of scientific and technical societies on both sides of the Atlantic. Much enthusiasm prevailed, generous applause punctuating the addresses of the several speakers.

The theme upon which Andrew Carnegie dwelt in his remarks was co-operation. He advanced the claim that among Americans was to be found a stronger disposition than among the people of other nations to work harmoniously, the idea of brotherhood being paramount. In co-operation, he said, lies the safety of human society. "Wherever men coalesce and try to do some good unification takes place, and wherever they conspire against the public good they find that they can't trust each other, and they fall. For that reason you needn't lie awake worrying about the future. For as sure as the sunflower turns toward the sun and receives light and heat, so sure are human beings marching onward and upward."

The address by President Hadley of Yale University on "The Professional Ideals of the Twentieth Century," was a high tribute to the engineer and the place won by him in the recognized learned professions. Evidently, he expects in the fullness of time that the engineer will take a more prominent part in the direction of public affairs. On this point he said: "If our engineers get their own minds clear and get the public mind clear as to the political economy of the properties intrusted to their charge and the ethics of their management, they can forestall those conflicts which now threaten to break out at every moment. There are three professions to-day which do not regard themselves as servants but as masters—the financier, the journalist and the politician. If the engineer and the lawyer accept positions as servants it is not simply a confession of inferiority, it is a dereliction of public duty."

The handle of the key of the building which figured in the exercises was prepared by Tiffany & Co., "with their compliments." The insignia is a laurel wreath bearing the crests of the three founder societies. Underneath a piece of rock crystal lie three grains of gold from the original gold discovered by John Marshall on Sutter Creek, California, in 1848.

Official estimates recently made of the cost of the improvements New York City will have to provide for by January 1, 1910, show that the city is practically committed to an expenditure in the interval of nearly \$200,000,000. Among the items are \$5,000,000 for the Manhattan section of the subway loop, \$10,000,000 for the Brooklyn section of the subway loop, \$35,000,000 for rapid transit lines in Manhattan and the Bronx, \$15,000,000 for a rapid transit line to Coney Island and \$4,700,000 for approaches to Manhattan and Blackwell's Island bridges. The other expenditures are in the main for new school buildings and other structures, and for park, street and viaduct improvements.

The Iron and Metal Trades

The United States Steel Corporation yesterday opened its books for Rails for 1908 delivery, no change in price being made. It is understood that a number of the railroads desired to secure deliveries for 1908, and that in the aggregate inquiries in hand foot up to about 250,000 tons. The Tennessee Company last week booked 46,000 tons for 1908 delivery for the Louisville & Nashville road. Current business for this year's delivery includes 20,000 tons for the Monterey, Fresno & Eastern, 10,000 tons for July delivery for the 'Frisco System, and a considerable number of smaller orders.

Steel in the Central West continues very scarce, and efforts are being made by a leading interest to secure Billets by going even so far afield as the South. The scarcity is most acute in the Wire trade, which is under very great pressure for deliveries. Efforts to accumulate some stock in anticipation of the spring trade have been unsuccessful, and it is doubtful whether the manufacturers ever entered the busy season with so small and so broken a stock.

The Structural trade presents a favorable aspect. Some moderate sized orders have been booked, including 4800 tons for an open hearth plant in Pittsburgh and 1200 tons for a copper works at Ely, Nev. New York Subway work is looming up. It is interesting to note that the Subway loop work, on which bids have already gone in, calls for 2500 tons of Structural Shapes and 3000 tons of Concrete Bars. The Lexington and Eighth Avenue lines will need 80,000 tons, divided about equally between Bars and Shapes. The work, of course, will extend over some years.

So far as can be learned, there have been only scattering purchases of Bars by the implement makers for the coming season, the makers and the mills not having got together as yet.

The heavy purchases of Steel making Irons made in Pittsburgh last week seem to have given a good deal of encouragement to makers of Merchant Iron of different grades, West and South. They do not, however, appear to have stimulated in any way buying of Steel making Irons in the territory east of the Allegheny Mountains, where Basic Iron has been lifeless.

Apparently there has been placed only a small part of the tonnage of Foundry Iron, for which three large consuming interests were inquiring last week. In one instance some foreign Iron was taken for Pipe purposes.

A good deal of Foreign Iron continues to come in and is expected to arrive at the rate of one 5000-ton boat per week for some time to come. It is being offered on the basis of close to \$19.50 per ton for Middlesbrough No. 3, ex-ship, in spite of the advance in prices abroad. This level of price, when compared with the cost of domestic Irons, explains the continuance of the import movement, since the Iron can penetrate very far inland.

It is a fact, in spite of all assertions to the contrary, that manufacturers of Copper Wire have asked that deliveries of Copper be postponed. There have been a number of cases involving important quantities.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Apr.17, 1907.	Apr.10, 1907.	Mar.20, 1907.	Apr.18, 1906.
PIG IRON, Per Gross ton:				
Foundry No. 2, Standard, Philadelphia.....	\$24.50	\$24.50	\$25.25	\$18.50
Foundry No. 2, Southern, Cincinnati.....	24.75	24.75	26.00	16.75
Foundry No. 2, Local, Chicago....	26.00	26.00	26.00	18.75
Bessemer, Pittsburgh.....	23.35	23.35	22.85	18.35
Gray Forge, Pittsburgh.....	21.85	21.60	21.75	16.85
Lake Superior Charcoal, Chicago	26.50	26.50	26.50	19.50

BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh....	30.00	30.00	29.00	27.00
Forging Billets, Pittsburgh....	36.00	36.00	36.00	32.00
Open Hearth Billets, Phila.....	31.50	31.50	33.00	29.00
Wire Rods, Pittsburgh.....	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross ton:				
Steel Rails, Melting, Chicago...	18.00	18.50	18.00	14.00
Steel Rails, Melting, Phila....	<i>19.00</i>	18.75	19.25	17.00
Iron Rails, Chicago.....	25.00	25.00	25.00	21.25
Iron Rails, Philadelphia.....	27.00	27.00	27.00	21.50
Car Wheels, Chicago.....	25.00	25.00	24.00	19.00
Car Wheels, Philadelphia.....	24.00	24.00	24.00	16.75
Heavy Steel Scrap, Pittsburgh...	18.00	18.00	18.00	15.00
Heavy Steel Scrap, Chicago....	<i>15.50</i>	16.00	16.00	13.00
Heavy Steel Scrap, Philadelphia	19.00	18.50	18.75	16.75

FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.	1.93½	1.93½	1.93½	1.63½
Common Iron Bars, Chicago...	1.81½	1.81½	1.81½	1.66½
Common Iron Bars, Pittsburgh.	1.80	1.80	1.80	1.55
Steel Bars, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh.....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York...	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh.....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York...	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh.....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.85	1.90	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh.	1.90	2.00	2.00	1.60

SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.50	2.50	2.50	2.25
Wire Nails, Pittsburgh.....	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh...	2.45	2.45	2.45	2.30

METALS, Per Pound:				
	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York.....	24.50	24.50	25.50	18.62½
Spelter, New York.....	6.80	6.85	6.95	6.05
Spelter, St. Louis.....	6.65	6.65	6.80	5.95
Lead, New York.....	6.12½	6.15	6.30	5.35
Lead, St. Louis.....	5.95	5.95	6.10	5.30
Tin, New York.....	40.50	40.85	40.65	38.85
Antimony, Hallett, New York...	22.00	22.25	23.00	20.00
Nickel, New York.....	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York...	\$4.00	\$4.00	\$4.00	\$3.79

Chicago.

FISHER BUILDING, April 17, 1907.—(By Telegraph.)

A feeling of unqualified strength dominates the entire market and extends with equal force through all lines of crude and finished products. Manufacturers are busily engaged, and are seemingly more concerned with problems of production than with those relating to market conditions. The demand from all consuming interests is well sustained, and specifications on contracts are being freely furnished far in advance of delivery dates. In support of the repeated denials by mills of cancellations reported to have been made, attention is being directed to the fact that waiting orders have not been advanced to fill vacancies caused by withdrawals. It would seem that if extensive cancellations of orders had occurred the effects would be apparent in relieved congestion of mill order books, which has not yet been observed. In addition to last week's purchase of 20,000 tons of rails by the Chicago traction systems, there has been some buying by railroads of Standard Section Rails and Structural Material, which, though of ordinary character, indicates that these interests have by no means wholly withdrawn from the market. The demand for Steel Bars is exceptionally strong and contracts for round lots are being placed at ruling prices, which are firm. In spite of the unbroken quietness and dearth of transactions in Pig Iron, no yielding in the resolute maintenance of prices has resulted. The market for Foundry Irons has on the whole become somewhat stronger in tone in sympathy with the heavy buying of Steel making Irons last week by Pittsburgh interests. No prices lower than \$18.50, Birmingham.

for No. 2 Foundry are now being quoted. Quite a number of inquiries for moderate sized tonnage to cover second half requirements have recently appeared in the market, but not much actual buying has developed. Buyers are naturally reluctant to accept the increased cost of production that purchases at present prices would involve, and prefer to await developments in the hope of more advantageous offers later on.

Pig Iron.—Lack of buying interest in Pig Iron has reduced the market to a state of lethargy so far as active buying is concerned. Sales of a few scattering carloads here and there constitute the entire tonnage of spot transactions. Prices for prompt delivery are, however, practically unchanged and range from \$22.50 to \$23, Birmingham, for No. 2 Foundry. The minimum quotation for the full second half is now \$18.50, Birmingham. Valley Iron for last half delivery is held at \$22 at furnace, or \$24.30, Chicago delivery, for No. 2 Foundry. When compared with the activity seen during the first quarter of this year, the tonnage now being moved is extremely light. One interest reports sales of 1000 tons last week in lots of 150 to 300 tons for the last half at \$18.50. Inquiries representing upward of 15,000 tons are reported in the market almost wholly for forward delivery, but have so far resulted in but a few sales. A specific inquiry for 3000 tons for deliveries beginning in July and running through the second half is noted. Northern Irons are rigidly held at \$24.40, Chicago, for No. 2. It is stoutly maintained by all furnace interests that there is far less unsold tonnage in sight for the remainder of the year's requirements than is commonly estimated, and at least one prominent Southern producer is still holding for \$19, Birmingham, for last half business, firm in the belief that before the season is far advanced that price will prevail. In the meantime buyers are generally waiting to see what will happen. The following quotations are for April, May and June shipments, f.o.b. Chicago:

Lake Superior Charcoal.....	\$26.50 to \$27.00
Northern Coke Foundry, No. 1.....	26.50 to 27.00
Northern Coke Foundry, No. 2.....	26.00 to 26.50
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	26.35 to 27.10
Southern Coke, No. 2.....	25.85 to 26.35
Southern Coke, No. 3.....	25.35 to 25.85
Southern Coke, No. 4.....	24.85 to 25.35
Southern Coke, No. 1 Soft.....	26.35 to 26.85
Southern Coke, No. 2 Soft.....	25.85 to 26.35
Southern Gray Forge.....	21.85 to 22.35
Southern Mottled.....	21.85 to 22.35
Malleable Bessemer.....	26.50 to 27.00
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 8 %	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10 %	34.30 to 34.80

Metals.—Copper prices show some weakness, which is reflected in a drop of 1c. per pound in the local market on Casting and Lake Copper. Buying is still confined to immediate needs of consumers. Lower prices are also quoted on Pig Tin, which is 2½c. per pound off. Prices of Old Metals are revised, and show a falling off from 1c. to 1½c. on the various grades. We quote as follows: Casting Copper, 25½c. to 26c.; Lake, 26c. to 26½c., in car lots for prompt shipment; small lots, ¼c. to ½c. higher; Pig Tin, car lots, 40½c.; small lots, 41½c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Coroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 7¼c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is \$8.60 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 17½c.; Heavy Copper Wire, 19c.; Copper Bottoms, 16¾c.; Copper Clips, 17½c.; Red Brass, 17c.; Red Brass Borings, 15½c.; Yellow Brass, 14c.; Yellow Brass Borings, 12¾c.; Light Brass, 12c.; Lead Pipe, 5.25c.; Tea Lead, 4¾c.; Zinc, 4¾c.; Pewter, No. 1, 25c.; Tin Foil, 31½c.; Black Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—The leading makers of Rods have but little, if any, surplus above their own requirements to offer, and quotations are therefore only nominal. Prices are governed by the individual circumstances surrounding each transaction, and range from \$37 to \$39, Pittsburgh, for prompt shipment. Forging Billets are firm and unchanged at a minimum of \$38, Chicago, which price is advanced according to size.

Rails and Track Supplies.—Aside from the purchase of 20,000 tons of Grooved Rails by the Chicago city traction companies, which was noted last week, some interest is being manifested in Steam Rails in the way of inquiries, from which at least one sale has resulted. Track Supplies are moving in fair volume, with no transactions of special significance reported. Prices are unchanged, save that prompt shipments command from 10c. to 15c. per 100 lb. above quotations. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.35c. to 2.45c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range

from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$35; 25-lb., \$36; 20-lb., \$37; 16-lb., \$38; 12-lb., \$39, f.o.b. mill. Standard Sections, \$28, f.o.b. mill full freight to destination.

Structural Material.—Mills continue to report undiminished receipts of specifications, together with a considerable tonnage of new business that keeps on developing from day to day. If the demand for Structural Shapes may be taken as indicative of confidence in a continuance of prosperous industrial growth, the prospects cannot be other than assuring. Among the contracts closed by the American Bridge Company are 3200 tons for plant buildings of the Nevada Consolidated Copper Mining Company, Ely, Nev.; 1900 tons for the Chicago & Northwestern Railway, and 800 tons for the Wisconsin Steel Company for plant improvements. A contract has been let to a local car building works for car under-frames for 400 80-ton box cars, which amounts to about 2000 tons. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—Scarcity of Steel is in a large measure responsible for the slow progress being made by the mills in efforts to catch up on overdue deliveries. Conditions are not much, if any, improved in this respect. Some mills are in position to make reasonably prompt shipment of select specifications, but on general orders from six to eight weeks, and even longer, are required for delivery. Mills in position to furnish Plates in from three to four weeks are asking premiums of from \$1 to \$4 a ton over the ruling quotation of 1.70c., Pittsburgh. We quote for future delivery as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16 in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.55c. to 2.65c.; No. 8; up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Consumers are importuning the mills for shipments that should have been received weeks ago, and in many cases manufacturers are compelled to resort to warehouse stocks to supply urgent needs. We quote as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c.; Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—The demand for Steel Bars is surprisingly strong, and besides the free offerings of specifications on contracts there is a tonnage of new business, quite large in the aggregate, coming into the market. From the trend of inquiries received, it is thought that general buying by the agricultural interests will not be long delayed. Desultory orders from those sources are already being placed, one of 5000 tons having been recently booked. Prices are firm at 1.76½c., Chicago. A little better demand for Iron Bars is noted, though it is not notably strong. The price of 1.81½c. generally quoted has in some instances been shaded \$1 a ton. Other quotations are as follows: Steel Bars, 1.76½c., with half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—On account of scarcity of Skelp, the mills have been unable to realize the full output capacity of the finishing departments, and the headway made in shipment of back orders is disappointingly slow. Much new business is coming forward, and unless something occurs to check the increasing demand there will be a rush of business following the resumption of quotations and bookings for shipment on June 1 by the leading interest. Warehouse stocks are being heavily drawn upon, especially for smaller sizes of both Black and Galvanized. There is no reported change in prices, which on base sizes are quoted nominally as fol-

lows: Black Steel Pipe, $\frac{3}{4}$ to 5 in., 72.35; Galvanized, 62.35, carload lots, Chicago. From store in small lots, Chicago jobbers quote 70 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—From six to eight weeks, and even longer time, is named for mill shipments of Merchant Tubes. The demand is well sustained and prices are firmly held. Prompt requirements are largely drawn from jobbers' stocks. Mill quotations for future delivery on the base sizes are as follows: $2\frac{1}{4}$ to 5 in., in carload lots, Steel Tubes, 63.35; Iron, 50.35; Seamless, 49.35; $2\frac{1}{2}$ in. and smaller, and lengths over 18 ft. and $2\frac{1}{2}$ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to $1\frac{1}{2}$ in.	35	35	35
$1\frac{1}{2}$ to $2\frac{1}{4}$ in.	50	35	35
$2\frac{1}{4}$ in.	52 $\frac{1}{2}$	35	35
$2\frac{1}{2}$ to 5 in.	60	47 $\frac{1}{2}$	47 $\frac{1}{2}$
6 in. and larger.	50	35	..

Merchant Steel.—A strong local demand for the larger sizes of Round Edge Tire is noticed, and a seasonable run of orders for Shafting, Finished Machinery Steel and special grades and shapes, furnishes an aggregate of business that is satisfactory. Prices are unchanged, and are as follows: Planished or Smooth Finished Tire Steel, 1.96 $\frac{1}{2}$ c.; Iron Finish, up to $1\frac{1}{2}$ x $\frac{1}{2}$ in., 1.91 $\frac{1}{2}$ c.; Iron Finish, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger, 1.76 $\frac{1}{2}$ c., base; Channels for solid rubber tires, $\frac{3}{4}$ to 1 in., 2.26 $\frac{1}{2}$ c., and $1\frac{1}{2}$ -in. and larger, 2.16 $\frac{1}{2}$ c.; Smooth Finished Machinery Steel, 2.16 $\frac{1}{2}$ c.; Flat Sleigh Shoe, 1.91 $\frac{1}{2}$ c.; Concave and Convex Sleigh Shoe, 2.06 $\frac{1}{2}$ c.; Cutter Shoe, 2.45c.; Toe Calk Steel, 2.31 $\frac{1}{2}$ c.; Railroad Spring, 1.96 $\frac{1}{2}$ c.; Crucible Tool Steel, 6 $\frac{1}{2}$ c. to 8c. and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—No new lettings involving notable tonnages are reported in this market. Quite a number of small orders of 500 tons and under for Pipe up to 16 in. are steadily coming in. It is understood that part of the contract for 2600 tons let by the city of Portland, Ore., last week was secured by a local foundry. In sympathy with the unyielding hardness of the Pig Iron market, prices are firmer, though quotations are unchanged, and we quote per net ton as follows: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

Coke.—Foundries are generally full of work, and there is a correspondingly good demand for Coke, though prices are somewhat easier. Connellsville 72-hr. Coke per car lot at ovens, for prompt shipment, is quoted at \$3.25 to \$3.50; Solvay Coke, \$6.75, Chicago, prompt delivery; on contract lots for future delivery \$6.50 is being done.

Old Material.—So far as any special movement is concerned, the market as compared with last week is about stationary. Mills are buying conservatively on favorable offers, but are apparently not in urgent need of stock. It is understood that the large railroad offerings of last week have been marketed, but without materially affecting prices, which show but little change. Though there is not so great a scramble for Cast Scrap as was seen during the extreme scarcity of Pig Iron, the demand has not yet weakened sufficiently to affect prices materially. The following quotations are per gross ton, f.o.b. Chicago:

Old Iron Rails.	\$25.00 to \$26.00
Old Steel Rails, 3 ft. and over.	18.50 to 19.00
Old Steel Rails, less than 3 ft.	18.00 to 18.50
Relaying Rails, standard sections, subject to inspection.	31.00 to 32.00
Old Car Wheels.	25.00 to 25.50
Heavy Melting Steel Scrap.	15.50 to 16.00
Frogs, Switches and Guards.	16.50 to 17.50
Mixed Steel.	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates.	\$19.50 to \$20.50
Iron Car Axles.	26.50 to 27.00
Steel Car Axles.	21.00 to 21.50
No. 1 Railroad Wrought.	15.25 to 15.75
No. 2 Railroad Wrought.	14.25 to 14.75
Railway Springs.	15.00 to 15.50
Locomotive Tires, smooth.	17.00 to 17.50
No. 1 Dealers' Forge.	12.00 to 12.50
Mixed Bushing.	11.00 to 11.50
Iron Axle Turnings.	11.50 to 12.00
Soft Steel Axle Turnings.	11.50 to 12.00
Machine Shop Turnings.	11.50 to 12.00
Cast Borings.	9.50 to 10.00
Mixed Borings, &c.	9.50 to 10.00
No. 1 Mill.	10.00 to 10.50
No. 2 Mill.	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings.	11.50 to 12.00
No. 1 Cast Scrap.	19.00 to 20.00
Stove Plate and Light Cast Scrap.	15.00 to 15.50
Railroad Malleable.	16.50 to 17.00
Agricultural Malleable.	15.50 to 16.00

The Chamber of Commerce and the Merchants' and Manufacturers' Association of Pittsburgh have been consolidated and the new organization will be known as the Pittsburgh Chamber of Commerce.

Pittsburgh.

PARK BUILDING, April 17, 1907.—(By Telegraph.)

Pig Iron.—Following the heavy sales of Bessemer and Basic Iron for second quarter and last half of the year delivery, reported last week, the Pig Iron market has been quiet and there is only a fair inquiry. Prices are firm, Bessemer and Basic Iron for second quarter delivery being hard to obtain and held at \$22.50 to \$23, Valley furnace, while it is likely that \$23 would have to be paid to bring out any Iron. The leading sellers, these being the Bessemer Pig Iron Association and W. P. Snyder & Co., are pretty well sold up for the balance of the year, but some of the outside furnaces still have Bessemer and Malleable Bessemer to offer for second half delivery. There is only a moderate inquiry for Foundry Iron, Northern No. 2 being held at \$24 to \$25 for spot delivery and \$23 to \$24 for May and June at Valley furnace. For second half of the year delivery Northern No. 2 Foundry is held at \$22 and up to \$23, Valley furnace. A sale of 2000 tons has been made for last half delivery at \$22, Valley furnace. There is some inquiry in the market for Forge Iron, which is firm and higher. A sale of 2000 tons of Northern Forge is reported at \$21, Valley furnace, for third quarter delivery. We quote Northern Forge at \$21, at furnace, or \$21.85, Pittsburgh, and note that some sellers are quoting as high as \$21.50 at furnace.

Steel.—The scarcity of Bessemer and Open Hearth Billets seems to be getting worse instead of better. Several large inquiries for Billets for forward delivery are in the market, but the business has not yet been placed, as none of the mills seem to be able to make the deliveries wanted. We quote Bessemer Billets at \$30 to \$30.50, and Open Hearth at \$31 to \$31.50, Pittsburgh. Sheet and Tin Bars for early delivery are held at \$30.50 to \$31, makers' mill, for early delivery. Consumers who are covered by contract are getting their Bars in some cases at \$30, makers' mill.

(By Mail.)

The heavy sales of Bessemer Pig Iron for second quarter and last half of the year delivery, set forth in this report last week, have had the natural effect of greatly strengthening prices on Pig Iron and Billets, and also on Finished Material. The heavy purchases of Pig Iron by leading Steel interests are taken to mean that they have faith in the continuance of present conditions for the balance of the year. The Bessemer Pig Iron Association, W. P. Snyder & Co. and other leading sellers of Bessemer, Basic and Malleable Bessemer Iron are practically sold up on their entire output for 1907, which is a very unusual condition so early in the year. Reports of cancellations of important contracts by railroads and other consumers seem to have faded away in the last week or two and are now seldom heard. The large Steel interests report that specifications on contracts are coming in freely, and with the output heavier than ever before the mills are still far behind in deliveries. Unless there should be some unexpected financial trouble or failure of crops, there is no apparent reason why the rest of this year should not show as busy a period for the Steel trade as in the first quarter. The financial situation is looking better, money is easier and there is nothing discouraging in sight. Rail contracts already booked insure full operation of the mills for the balance of this year, and the same is largely true in practically all lines of Finished Iron and Steel.

Ferromanganese.—Foreign 80 per cent., for shipment over the second half of the year, is freely offered at \$65, delivered, and there are reports of even lower prices having been made. For delivery in the next two or three months from \$70 to \$72, Pittsburgh, is quoted. A sale of 50 tons of foreign 80 per cent., for May and June delivery, has been made at about \$70, delivered, Pittsburgh.

Muck Bar.—Prices on Forge Iron are decidedly firmer, and this is having its effect on Muck Bar. We quote best grades made from all Pig Iron at \$37 to \$37.50, Pittsburgh, a sale of 300 tons for May delivery being reported at the latter price.

Rods.—There is a fairly active demand for Rods, but they are hard to obtain, the two leading makers having been practically out of the market as sellers for a long time. We continue to quote Bessemer and Open Hearth Rods from \$37 to \$38, Pittsburgh.

Skelp.—Large inquiries for Sheared Steel and Sheared Iron Skelp are in the market, but the mills are heavily sold up and cannot promise deliveries before July or August. One leading interest has been in the market for some time for a large tonnage of Iron Skelp in Sheared sizes, and has not been able as yet to get the deliveries wanted. Prices are firm, as follows: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.90c. to 1.95c.; Grooved Iron Skelp, 2.20c. to 2.25c.; Sheared Iron Skelp, 2.30c. to 2.35c.

Steel Rails.—While there is a good deal of inquiry the actual orders being placed are relatively small. The Carnegie Steel Company booked contracts the past week for about 15,000 tons of Standard Sections and about 1500 tons of

Light Rails. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Structural Material.—Inquiries are much more plentiful, and a good deal of tonnage is being placed. The McClintic-Marshall Construction Company has taken 3500 tons of bridge work for the Michigan Central Railroad, 1000 tons for two Steel coal tipples in the Connellsville region, about 700 tons for a new building for the Keith Car Company, Boston, Mass., and about 5000 to 7000 tons for a coal pier for the Tidewater Railway at Norfolk, Va. Another local concern has taken a contract for 4800 tons of Steel for a building to contain an Open Hearth plant. A great deal of other large work is in sight, much of which is expected to be placed shortly. The mills are making fairly prompt deliveries on Shapes, but on Plates and Steel Bars shipments are very much delayed. The market is firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x 1/4 in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—While new business is possibly not quite as heavy as some time ago, yet the leading mills are sold up so far ahead that they would be glad to see a slight falling off to allow them to catch up on deliveries. Some mills can make shipments in from six to eight weeks, but the larger concerns are much further behind. For reasonably prompt shipments slight premiums over official prices are being paid. We quote: Tank Plate, 1/4-in. thick, 6 1/4 in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4-in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Roller and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of 1/4 of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—The demand for both Black and Galvanized Sheets continues heavy, and orders for Roofing Sheets will show a steady increase with the return of good weather, which will permit outside building operations to go ahead vigorously. There is still a shortage in the supply of Steel Bars and also in cars, these causes interfering with both output and shipments. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—The volume of business is getting heavier and the mills are entering a good many orders at full prices, which are as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—An active demand is observed for Tin Plate, both for third and fourth quarters, some mills refusing to take orders for the last quarter except at a slight advance over present prices. The mills are seriously crippled in their operations by reason of the shortage in the supply of Tin Bars and also the scarcity of cars. Official prices for second and third quarter shipment are as follows: \$3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—While there has been some buying of Steel Bars by the agricultural implement makers for last half of the year delivery it is by no means general, and the tonnage so far placed is relatively small for this trade. This is due to the fact that the mills have refused to make any concession in prices to the implement makers, some of whom have decided to buy for current wants instead of placing contracts ahead. Specifications on contracts for Steel Bars are coming in freely, and shipments by the mills are heavy. We also note a fairly active demand for Iron Bars, but it is not quite as heavy as some time ago, while prices are a shade easier. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery.

Spelter.—New business being placed is very light, and we quote prime grades of Western Spelter at 6.75c., St. Louis, and for forward delivery at 6.65c., St. Louis, or 6.77 1/2c., Pittsburgh.

Railroad Spikes.—The demand for the smaller sizes of Spikes continues heavy, and the mills are still from two to three months behind in deliveries. On the standard sizes the mills are not so well filled up and can make reasonably prompt shipments. We quote standard sizes at \$2.30 to \$2.35, and the smaller sizes at \$2.50 to \$2.60 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The demand for Tire Steel is quite active, but for the other grades is only fairly good. Specifications on contracts are coming in freely, but the mills are catching up on deliveries to some extent. Prices are firm, and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Merchant Pipe.—We note an inquiry in the market for 20 miles of 16-in. Steel Line Pipe, which is likely to be placed this week. The demand for Pipe continues abnormally heavy, and the leading interest has not yet made any announcement as to its probable action in regard to prices after June 1, all orders booked in the meantime being subject to whatever prices may be decided upon after that date. Official discounts are not being closely regarded, some mills stating they are able to obtain premiums of \$1 to \$2 a ton where reasonably prompt shipments are specified. The extreme discount on Merchant sizes of Iron Pipe is now about 68 per cent. on 3/4 to 6 in., on which a half point and sometimes a point is allowed to the large trade. The extreme discount on Merchant sizes of Steel Pipe, 3/4 to 6 in., is now about 74 and 5 per cent. to the large trade. Official discounts on Steel Pipe are as follows:

	Jobbers, carloads. Steel.	
	Black.	Galv.
1/4 to 1/2 in.....	.65	.49
3/8 in.....	.67	.53
1/2 in.....	.69	.57
3/4 to 6 in.....	.73	.63
7 to 12 in.....	.68	.53
Extra strong, plain ends:		
1/4 to 3/8 in.....	.58	.46
1/2 to 4 in.....	.65	.53
4 1/4 to 8 in.....	.61	.49
Double extra strong, plain ends:		
1/2 to 8 in.....	.54	.43

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

	Standard Genuine Iron Pipe.	
	Black.	Galv.
3/4 to 6 in.....	.68	.58
1/2 in.....	.63	.51
3/8 in.....	.61	.43
1/4 and 1/2 in.....	.59	.43
7 to 12 in.....	.63	.48

Extra Heavy Iron Pipe, Plain Ends.		
1/4, 1/2 and 3/8 in.....	.63	.41
1/2 to 4 in.....	.60	.48
4 1/2 to 8 in.....	.56	.43

Boiler Tubes.—A continued active demand is enjoyed for both Locomotive and Merchant Tubes. Some good sized orders are being placed, and in some cases these are at a premium of \$1 to \$2 a ton over the official discounts, which apply on Tubes for forward delivery only and are as follows:

	Boiler Tubes.	
	Iron.	Steel.
1 to 1 1/2 in.....	.41	.47
1 1/2 to 2 1/2 in.....	.42	.50
2 1/2 in.....	.47	.61
2 3/4 to 5 in.....	.52	.65
6 to 13 in.....	.42	.59

Iron and Steel Scrap.—Very little tonnage in Scrap is moving, large consumers being pretty well covered for some time ahead, and willing to take chances on the market when they have to buy later on. The better feeling in the Pig

Iron market has not been reflected as yet to any extent in the Scrap trade. Dealers quote about as follows: Heavy Steel Scrap, \$18 to \$18.25, for Pittsburgh, Sharon or Steubenville delivery; No. 1 Wrought Iron Scrap, \$19.50; No. 2, \$18; Old Steel Rails, short pieces for Open Hearth purposes, \$18 to \$18.25; Old Steel Rails, rerollers, \$19.75 to \$20; Machine Shop Turnings, \$15.75 to \$16; Bundled Sheet Scrap, \$16.75 to \$17; Tin and Terne Plate Clippings, \$18.50 to \$19, in net tons. Low Phosphorus Melting Steel is \$22; Cast Iron Borings, \$14.50; Old Car Wheels, \$24.50 to \$25; Steel Axles, \$22 to \$22.50; No. 1 Cast Scrap, \$21.50; Grate Bars, \$17; Stove Plate, \$16.50. All above prices are per gross ton, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—A contract has been made for a round tonnage of Connellsville Furnace Coke for shipment over the last half of the year, on the basis of \$2.85 at oven. There is still a plentiful supply of Coke for prompt shipment, and we quote strictly Connellsville Furnace Coke for April delivery at \$2.75, and 72-hr. Foundry at \$3.25 to \$3.50 at oven. Lower Connellsville Furnace Coke for spot shipment is offered as low as \$2.50 at oven, and high Sulphur Coke as low as \$2.25. The output continues heavy, the Upper and Lower Connellsville regions having made last week 416,770 tons. There are 34,288 ovens in both regions, of which 32,409 were active last week and only 1879 idle.

The offices of the Sharon Steel Hoop Company, manufacturer of Billets, Sheet and Tin Bars and Steel Hoops, have been removed from the Farmers' Bank Building to Rooms 1215-1216 Union Bank Building, Fourth avenue and Wood street, Pittsburgh.

Philadelphia.

PHILADELPHIA, PA., April 16, 1907.

The Iron and Steel trades appear to be immune against unfavorable happenings in other directions. The continuous jolts that are occurring in Wall Street are absolutely ignored as regards the Iron situation, and it will be extraordinary if such conditions continue indefinitely, but we are confronted with conditions which appear to destroy the most elaborate theories. What is wanted is a larger supply of Pig Iron and not an intimation that prices are going to be lower. This is, of course, by no means an improbability, but "while the grass is growing the cattle are starving." It is probably not unfair to say that spot lots of Pig Iron at high premiums are not as urgently called for as they were some time ago, but there is a significant firmness for deliveries during the second and third quarters. This applies to nearly all grades of Pig Iron, but is more marked in Foundry Irons than in Mill Irons or in Basic. The last named appears to be neglected temporarily, and from the fact that consumers are not asking for quotations on new business it is presumed that they are getting better deliveries; but, even if it was wanted, there is little or no second quarter Iron that can be made available at the present time. Sales of Middlesbrough Iron are constantly being made at prices varying from \$20.75 to \$21.25, alongside ship, and \$23.50 for Scotch Iron. These Irons seem to be gaining in favor with the foundry trade, and at the prices at which they are quoted it will be strange, indeed, if they do not ultimately interfere with the sale of American Irons. Deliveries from this port are very heavy, shipments having been made to New England, New York, and in some cases as far west as Pittsburgh and Cleveland. A cargo of 5000 tons arrived here last week, and two or three more will be loaded before the end of the month, so that the supply during May and June is expected to be quite liberal. Under such conditions sellers of Pig Iron are considerably mystified as to the final outcome. A great many think that the market will be none the worse for a slight reaction, but when there is such an extraordinary demand as there is at present they see no use in making lower quotations. The quantity of Iron melted has been a continual surprise to producers, and while for months they have been expecting some kind of a let up, yet as a matter of fact there is no more evidence of its approach in the near future than there has been at any time since the first of the year. It is an old saying that "the pitcher goes often to the well, but is broken at last," and this may sooner or later be applicable to the demand for Pig Iron. In the meanwhile, however, the movement is of the same general character that it has been since last fall, and a careful investigation shows that there are no signs yet of any material change. The decline in price of Coke under the stress of competition to secure business for new ovens may have some influence on Pig Iron, as the reduction in price is large enough to make a material difference in the cost of production of Pig Iron.

Pig Iron.—The market maintains a strong tone, considering the uncertainties in regard to the business outlook, and a very considerable tonnage has been closed in the past few days. There is also more disposition to do business for the last quarter of the year than has been noticed for some time, some large lots having been taken at the quotations which are given below, varying according to the character of

the order. In cases in which some portion is for June delivery prices are somewhat higher than for those which are purely for the second quarter, and by the same rule if a portion of the order goes over into the last quarter the quotations are modified. Spot lots are still very scarce and command anywhere from \$25.50 to \$26.50, delivered. The tonnage in such cases is not large, but where the Iron is wanted immediately price is no great object. Taking the average situation as compared with last week, it is clear that there is no impairment in the situation, and while many well-informed people are still figuring on lower prices in the near future, month after month seems to pass away without any realization of what has been expected. A strong feature in favor of that theory is, however, that foreign Iron is arriving in large quantities, and with recent purchases in London and Glasgow there is every reason to expect that it will at least keep prices of American products in check. Sales of this class of Iron have been very numerous in the past week, and at the rates at which it can be secured it is certainly a great relief to those who would otherwise have to pay the fancy prices for spot lots. Basic Iron is entirely neglected, although a portion of the Chinese Iron has been sold to arrive at a price said to be about \$24, delivered at mill. There is not much doing in Low Phosphorus Iron, although one lot of 4000 tons was taken at a price a trifle under \$27, delivered. The general range of prices for deliveries in buyers' yards, eastern Pennsylvania or adjoining territory is about as follows: Spot No. 2 X Foundry, \$25.50 to \$26.50.

Second Quarter 1907.

No. 2 X Foundry.....	\$24.50 to \$25.00
Standard Gray Forge.....	22.50 to 23.00
Basic.....	24.00 to 24.50
Low Phosphorus.....	27.00 to 27.50
Middlesbrough, on dock.....	21.25 to 21.75

Third Quarter 1907.

No. 2 X Foundry.....	\$24.00 to \$24.25
Standard Gray Forge.....	22.00 to 22.50
Basic.....	24.00 to 24.25
Low Phosphorus.....	27.00 to 27.25

Fourth Quarter 1907.

No. 2 X Foundry.....	\$23.00 to \$23.50
Standard Gray Forge.....	21.50 to 22.00
Basic.....	23.50 to 23.75
Low Phosphorus.....	26.75 to 27.00

Ferrolloys.—There is not much demand at the moment, but prices are fairly steady at the figures quoted last week, which would be \$68 to \$70 for shipments during the remainder of this quarter, or for the last half of the year, \$63 to \$65, according to quantity and requirements as to date of shipment.

Steel.—Business is not active, although there is a fair movement at about the figures quoted last week, which would be \$31.50 to \$32, delivered, for Ordinary Steel Billets, and \$36 to \$40 for Forging Steel.

Plates.—The demand is not very active, and prices are inclined to sag off, and in some instances 2c. has been shaded for desirable specifications on ordinary ¼-in. Plates. Specifications are satisfactory and mills have as much as they can do to meet the demand for prompt deliveries. Prices are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.98½	2.03½
Flange or Boiler Steel.....	2.23½	2.28½
Marine.....	2.53½	2.58½
Locomotive Firebox Steel.....	2.63½	2.68½
The above are base prices for ¼-in. and heavier. The following extras apply:		
3-16-in. thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 in.....		.05
Plates over 110 to 115 in.....		.10
Plates over 115 to 120 in.....		.15
Plates over 120 to 125 in.....		.25
Plates over 125 to 130 in.....		.50
Plates over 130 in.....		1.00

Structural Material.—The market in this territory is somewhat irregular. Construction work is sharply competed for, and it is clear from the prices that have been made that the official prices have not been fully maintained, although nominally 1.83½c. to 2c. is quoted for Beams, Angles and Channels, according to specifications.

Bars.—The demand for Bars is well maintained, although it is said that prices have in some cases been shaded a half tenth, and for something very desirable the full tenth concession has been made. Steel Bars are scarce, and for prompt shipment readily command 1.93½c., which is also the nominal price for Refined Bar Iron.

Sheets.—The demand for Sheets is fully maintained, and mills have all they can do to keep up with shipments which have been promptly specified. Prospects in this line are very encouraging, and prices are firm at last week's quotations, which for mill shipments are as follows, subject to the usual advance for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market for Old Material is in a most peculiar condition, changing its aspect sometimes very

unexpectedly. Steel Scrap is very scarce, and deliveries are far behind the dates contracted for. Steel that was sold at \$18.75 has been bought in to cover short contracts at \$19 and over that, so that consumers find it very difficult to get enough material to carry them from day to day. For other grades of material, some mills whose stocks are running light on certain articles, are willing to pay last week's quotations, while others whose supplies are sufficient are not inclined to make bids even at the low figures quoted in our last. The general situation is one of uncertainty and unsettlement, arising largely from the inability of dealers to make deliveries on old contracts. Bids and offers at this date for delivery in buyers' yards in this district are about as follows:

Steel Crops and Rails.....	\$19.00 to \$19.50
No. 1 Steel Scrap.....	19.00 to 19.25
Low Phosphorus.....	22.50 to 23.50
Old Steel Axles.....	21.50 to 22.00
Old Iron Axles.....	30.00 to 31.00
Old Iron Rails.....	27.00 to 27.50
Old Car Wheels.....	24.00 to 25.00
Choice No. 1 R. R. Wrought.....	20.50 to 21.00
No. 1 Yard Scrap.....	18.50 to 19.00
Long and Short.....	18.00 to 18.50
Machinery Scrap.....	21.00 to 21.50
Wrought Iron Pipe.....	17.00 to 17.50
No. 1 Forge Fire Scrap.....	16.50 to 17.00
No. 2 Light.....	11.50 to 12.00
Wrought Turnings.....	16.75 to 17.25
Axle Turnings.....	16.75 to 17.00
Stove Plate.....	17.25 to 17.75
Cast Borings.....	15.50 to 16.00
Grate Bars.....	16.00 to 16.50

Cincinnati.

FIFTH AND MAIN STS., April 17, 1907.—(By Telegraph.)

Pig Iron.—Market conditions appear to be much stronger, and the situation generally has a more hopeful outlook. Inquiry has developed to a considerable extent, and the heavy sales of Bessemer Iron in Pittsburgh territory have had a very strengthening effect. Increased interest has been manifested in Foundry Irons, and a number of large consumers have bought for third quarter and last half requirements. It would appear, however, from all reports that a large percentage of melters are still short of anticipated needs for this delivery, as is evidenced by the inquiries before the trade. One inquiry for 1000 tons of Malleable comes from an Ohio melter for fourth quarter delivery; 300 tons of foundry grades from an Indiana concern; 1000 tons of foundry grades for July, August and September delivery, and 1300 tons for July to November delivery, both from plants in Ohio; 1000 tons of No. 2 Soft from one concern and 2000 tons from another in Indiana, both for last half delivery. Besides these, there are a number of 400 and 500 ton inquiries that aggregate considerable promised business. Two of the inquiries coming from Ohio melters that have been pending for several weeks have been closed, one buying 1000 tons of Northern for last half, the other 2500 tons of both Northern and Southern for third quarter delivery. In addition to these there was one sale of 2000 tons of special Irons and 800 tons of Car Wheel Iron, the latter reported to have been on the basis of \$22, Valley furnace. A Pipe company is also said to have secured 5000 to 6000 tons for second quarter delivery. The continued improvement shown in the car situation has had its effect on the spot market, and the result has been that prices for immediate delivery are slightly lower than they were a week since. Iron obtainable for this delivery is now quotable from \$22 to \$22.50, with May and June shipments fairly well established at \$21.50 to \$22, Birmingham. Last half is \$18.50, minimum, with a large number of Southern producers firm at \$19. Freight rates from Hanging Rock District to Cincinnati are \$1.15, and from Birmingham, \$3.25. We quote for second quarter delivery, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$25.25 to \$25.75
Southern Coke, No. 2.....	24.75 to 25.25
Southern Coke, No. 3.....	24.25 to 24.75
Southern Coke, No. 4.....	23.25 to 23.75
Southern Coke, No. 1 Soft.....	25.25 to 25.75
Southern Coke, No. 2 Soft.....	24.75 to 25.25
Southern Coke, Gray Forge.....	22.25 to 22.75
Southern Coke, Mottled.....	21.25 to 21.75
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.65
Lake Superior Coke, No. 1.....	25.15 to 25.65
Lake Superior Coke, No. 2.....	24.65 to 25.15
Lake Superior Coke, No. 3.....	24.15 to 24.65

Car Wheel Irons.

Standard Southern Car Wheel.....	\$29.00 to \$29.50
Lake Superior Car Wheel.....	27.50 to 28.00

Coke.—The market is easy and quiet. There is perhaps a little more inquiry, with reports showing negotiations pending for some large blocks for early shipment. The supply is plentiful and consignments are moving forward satisfactorily. We quote the best brands of Connellsville and Virginia Foundry from \$3.50 to \$3.85, f.o.b. ovens.

Finished Iron and Steel.—Structural lines are still very active, and new specifications are coming forward steadily. Prices are unchanged and firm. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.83c., with half extras, smaller lots from store, 2c., with full extras.

Steel Bars, carload lots, 1.73c., half extras, smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.83c. Beams and Channels, carload lots, 1.83c., base. Plates, ¼-in. and heavier, carload lots, 1.83c., base, and smaller lots from store 2c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from stock 2.50c. Steel Tire, 1 x ¼ in. or heavier, 1.93c. in carload lots.

Old Material.—The market for Scrap is rather quiet. The supply appears to be in excess of the demand, and dealers are piling some in their yards. Prices show a slight decline. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton.....	\$18.00 to \$18.50
Cast Borings, net ton.....	9.50 to 10.00
Steel Turnings, net ton.....	11.50 to 12.00
No. 1 Cast Scrap, net ton.....	17.50 to 18.00
Old Iron Axles, net ton.....	26.25 to 27.25
Old Iron Rails, gross ton.....	26.50 to 27.00
Old Steel Rails, long, gross ton.....	18.75 to 19.75
Relaying Rails, 56 lb and up, gross ton.....	28.25 to 29.25
Old Car Wheels, gross ton.....	23.50 to 24.50
Low Phosphorus Scrap, gross ton.....	20.75 to 21.25

Cleveland.

CLEVELAND, OHIO, April 16, 1907.

Iron Ore.—Ore shippers were disappointed in their expectations that boats would get away from Lake Superior ports with Ore cargoes by April 15. There is still from 12 to 15 in. of solid ice at Sault Ste. Marie, the ice being fully as solid as a week ago as a result of the cold weather the past week. Present indications are that navigation will not open at the Soo before Saturday, and some predict that April 25 will be nearer the date. The cold weather the past week or two has interfered with the operations at the mines and with the movement of Ore to upper lake ports. Considerable Ore has been taken to Escanaba, but it was badly frozen and was handled with difficulty. Some smaller boats are now being loaded at that port. Reports from the Gogebic range say that there were heavier snow drifts there last week than at any time during the winter. Furnaces are still fairly well supplied with Ore, and there is no danger of any serious shortage before new Ore begins to arrive at the furnaces, which will not be later than May 1. Ore is still being moved rapidly from the docks, and when navigation opens there will be little of the better grades of Ore left on the docks. The Ore market continues quiet, with prices firm. There have been three inquiries for a good sized tonnage of Bessemer Ore in the market the past week, one of the inquiries being from an Eastern furnace. As far as can be learned, however, no sales were made. Only a small quantity of the better grades of Ore is left for sale. Ore prices for 1907 deliveries at Lake Erie docks are as follows per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.25; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous Non-Bessemer, \$2.50.

Pig Iron.—The Foundry Iron market is more active than it has been for several weeks and prices are very strong. While the demand for spot Iron has largely subsided, indicating that foundries are pretty well covered for the present, there are many inquiries for Iron for delivery during the second half, and several good sized sales have been made, at \$22 and \$22.50, at furnace, for No. 2 Northern Foundry. Some sales of No. 2 Foundry for the third quarter are reported, at \$23, Valley furnace, and the same interest is now holding No. 2 Foundry Iron at that price, for last quarter delivery. A few sales of Northern No. 2 are reported for spot shipment, at \$25, at furnace. Southern Foundry Iron for last half delivery is a little more active and prices are firm. Sales are reported at \$18.50, Birmingham for No. 2 for second half, although some furnaces are holding their price firm at \$19, Birmingham. An occasional sale of Middlesbrough Iron is still being made at \$24.88, Cleveland. The Bessemer Iron situation is very strong, as a result of the large sales made last week by the Bessemer Pig Iron Association. One local interest is out of the market, having sold about 25,000 tons of Bessemer Iron, and having nothing left for delivery before January 1, 1908. Another local interest that disposed of considerable tonnage announces that it is not anxious to make any more sales for the present and that it will sell no more Bessemer Iron as low as \$21, Valley furnace, the price that was paid a week ago. A local interest reports the sale of 15,000 tons of Basic Iron the past week for last half delivery, at \$21, Valley furnace. There are a number of inquiries in the market now for Basic Iron for second half delivery, and further sales are expected before the close of the week. Quotations for the last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer.....	\$21.85
Northern Foundry, No. 1.....	\$22.50 to 23.00
Northern Foundry, No. 2.....	22.00 to 22.50
Northern Foundry, No. 3.....	21.50 to 22.00
Southern Foundry, No. 2.....	22.85
Gray Forge.....	21.00 to 21.50

Coke.—A fair demand for Coke for prompt shipment is noted, but few inquiries are being received for future

delivery. Furnace Coke is selling at \$2.80 to \$2.90 at oven for prompt shipment. Foundry Coke is held at \$3.50 to \$3.60 at oven.

Finished Iron and Steel.—The volume of new business continues good in all lines, especially in Plates, Bars and Sheets, and there is no falling off in the heavy specifications that have been coming in. The mills are all crowded and no improvement is noted in any deliveries. The smaller mills are so filled up with orders that few of them are able to contract for quick deliveries at premium prices. The Steel Bar situation seems a little stronger, and Bars for prompt shipment are as scarce as ever. One Pittsburgh mill is reported to be getting 1.75c. to 1.80c., Pittsburgh, for Steel Bars for prompt shipment, and some sales as high as 1.90c., Pittsburgh, are noted. One western Pennsylvania mill reports that it is getting 1.70c., Pittsburgh, from some of its customers for Steel Bars for last half delivery, but other mills in making future contracts are not asking over 1.60c., Pittsburgh. The agricultural implement makers have not yet entered the market for their next year's requirements, but mill agents declare that, considering the present strength of the market, there will be no question about maintaining the price and that no concessions will be granted to the implement makers. The Bar Iron situation is easy. While the larger mills are asking 1.75c. and 1.80c., Pittsburgh, for new contracts, one mill is selling Iron Bars at 1.70c., Pittsburgh, or 1.79½c., Cleveland, for carload lots, and Indiana mills are reported to be quoting prices fully as low. The Plate situation is strong and deliveries are no better. Future contracts are being made on the basis of 1.70c., Pittsburgh, but some mills are quoting a minimum price of 1.90c. for shipment in two or three weeks and refuse to take orders for future deliveries at a lower price. One sale at 1.85c., Pittsburgh, for delivery during the balance of the year is noted. The Sheet situation shows no change. Some of the small mills are promising deliveries in from two to three months. Orders are being taken for a fair amount of Structural Material for second half delivery, but the mills are not overcrowded. Specifications are coming in in good shape from railroads for material contracted for some time ago. Forging Billets are in good demand and are being sold at from \$36 to \$40, Cleveland. Warehouse business in all kinds of Finished Material continues heavy, prices being unchanged. Jobbers are selling Steel Bars out of stock at 1.95c. to 2c., and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28, One Pass Cold Rolled, 3.05c.; No. 28, Galvanized, 4.15c. The stock price on Boiler Tubes, 2½ to 5 in., is 64 per cent. discount, and on Black Iron Merchant Pipe, base sizes, 67 per cent. discount.

Old Material.—There is a good demand from foundries for Cast Scrap, and the price is a little firmer. There is also some activity in Stove Plate. The demand for Borings and Turnings is fair, but not so heavy as it has been for several weeks. Otherwise the market is quiet, and there are but few inquiries. Consumers seem to be holding off in the hope of getting lower prices. Heavy Melting Steel and Railroad Wrought are weak, but dealers are not inclined to make any price concessions. There are no indications of a more active market in the near future. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$17.50 to \$18.00
Old Iron Rails.....	23.50 to 24.50
Steel Car Axles.....	21.50 to 22.50
Old Car Wheels.....	21.50 to 22.50
Relaying Rails, 50 lb. and over.....	29.00 to 31.00
Relaying Rails, under 50 lb.....	31.00 to 32.50
Heavy Melting Steel.....	16.50 to 17.00
Railroad Malleable.....	17.50 to 18.50
Agricultural Malleable.....	16.00 to 17.00
Light Bundled Sheet Scrap.....	16.00 to 17.00
Bundled Tin Scrap.....	17.00 to 19.00

The following quotations are per net ton, f.o.b. Cleveland:

Old Car Axles.....	\$29.25 to \$29.75
Cast Borings.....	10.50 to 11.00
Iron and Steel Turnings and Drillings.....	13.00 to 13.50
No. 1 Bushelling.....	14.50 to 15.00
No. 1 Railroad Wrought.....	17.50 to 18.00
No. 1 Cast.....	18.00 to 19.00
Stove Plate.....	14.50 to 15.00

Birmingham.

BIRMINGHAM, ALA., April 14, 1907.

Pig Iron.—While quite a number of sales have been made, buying has been confined almost entirely to the smaller melters, whose orders are usually for lots of 500 tons and less. One sale of 2000 and one of 3000 tons are reported, while two or three deals for a like amount are pending. Buying is principally for third quarter, with a few sales extending through the last half. There has been very little doing this week in spot Iron or for second quarter shipment, as the available Iron for these deliveries is limited, and the fact that consumers of Southern Iron are getting shipments much more regularly has also naturally lessened the demand for spot Iron. Prices ruling to-day are about as follows: April

shipment, \$22.50; May and June, \$21.50 to \$22; third quarter, \$18.50 to \$19, and last quarter, \$18.50. Stocks on furnace yards are rapidly decreasing and many requests are being received to rush April Iron, but so far as can be learned no consumer has asked for shipments to be withheld. No increase in production is expected this month as the several furnaces which have been out of blast undergoing repairs are still out, and in addition to this more or less trouble has been experienced in operations during the past two weeks, which has necessitated the temporary banking of two or three of the larger stacks in the district. One of the largest interests in the district whose average monthly production is about 25,000 tons states that its shipments for March amounted to 42,000 tons and that by May 1 it will have nothing except off grades in stock. Other producers report about the same proportion and it is expected that within the next two weeks practically all the high grade Iron which has accumulated here will be in transit.

Cast Iron Pipe.—All bids for Water Pipe were rejected by the city of Atlanta, Ga., this week on account of a controversy which has arisen between the Water Commission and the City Council. It is stated that the extension contemplated will be deferred for some time and that bids will probably be again asked for about July. Of the 2600 tons let by the city of Portland, Ore., this week, 500 tons of the larger sizes went to a local foundry in Portland and the balance of 2100 tons to the American Cast Iron Pipe Company of this city. Cincinnati is asking for bids on 2200 tons of Water Pipe, the contract to be let on the 22d inst. Quotations on Water Pipe per net ton are as follows: 4 to 6 in., \$35; 8 to 12 in., \$33; over 12 in., average \$31, with \$1 per ton extra for Gas Pipe.

Old Material.—The market is exceedingly quiet, there being little demand for any grade with the exception of Cast, and of this there is not much to be had. Dealers' quotations have been revised and are to-day approximately as follows per gross ton:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	16.50 to 17.00
Old Car Wheels.....	20.50 to 21.00
No. 1 Railroad Wrought.....	18.50 to 19.00
No. 2 Railroad Wrought.....	13.00 to 13.50
No. 1 Country Wrought.....	13.00 to 13.50
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.50 to 14.00
Railroad Malleable.....	13.00 to 13.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	16.00 to 17.00
Stove Plate and Light Cast.....	12.50 to 13.00
Cast Borings.....	8.50 to 9.00

The German Iron Market.

BERLIN, March 28, 1907.

Business booked in Bars will keep the mills occupied till the end of June, while many orders run considerably longer. Here, too, dealers are hesitating about placing orders for remoter delivery, and it is even mentioned that they are offering goods for dates some months ahead at slightly easier prices. Mill prices for Bars of Soft Steel (flusseisen) range between 147.50 and 150 marks, and between 150 and 155 marks for Siemens-Martin Steel and immediate delivery. Foreign orders for Bars are coming in steadily, the price being 140 to 142.50 marks, f.o.b. seaport. Home consumers continue to place good orders for Bars, particularly Iron.

Beams, Plates and Wire.

For Beams there is no great disposition on the part of buyers to place contracts for the June quarter, recently declared open by the Steel Association, but large engagements will be carried over from March into the June quarter. The mills are running under pressure, good foreign orders on short terms of delivery having come in; but it is admitted that in this line, too, new orders are being taken more slowly. The export price remains 119 to 125.50 marks, f.o.b. seaport. Some irregularity is reported in Heavy Plates. While there is much work on medium thicknesses for structural purposes, the mills running on heavier goods are looking for orders. Large orders for Ship Plates have recently been placed and considerable new work in Boiler Plates has come in, in addition to the large amounts already booked. The prices for Heavy Plates have grown slightly easier. While work in the thinner Plates and Sheets is abundant at present and buyers are still ordering for immediate necessities, orders for later months are few.

The make of rolled wire is sold up to the end of June, and business beyond that date is hardly to be expected in view of the unsolved question of the prolongation of the combination controlling these goods. Work is very active, but is hindered through lack of prompt delivery of stock. The demand for drawn wire has slackened, but the mills are fully at work, some of them having orders beyond the half year. There is the usual regular run of foreign orders for wire nails, but the home market displays a waiting attitude.

New York.

NEW YORK, April 17, 1907.

Pig Iron.—Prices continue fair on Foundry Irons whenever the buyer demands a specific brand, but when there is competition concessions are more readily made. There have been a number of good sized sales involving 1000 tons and upward, one of them for a boiler manufacturer calling for 2500 tons. We quote spot Northern Iron \$25.50 to \$26 and \$24.25 to \$24.75 for No. 2 Foundry. For the second quarter we quote \$25 to \$25.50 for No. 1 Foundry, \$23.50 to \$24 for No. 2 Foundry, and \$23 to \$23.50 for No. 2 Plain. Southern Iron is nominally quoted for spot, \$26 to \$26.50 for No. 2 Foundry, and for the third quarter \$22.50 to \$22.75.

Steel Rails.—The opening of the books of the leading Rail producer for orders for 1908 delivery at \$28, and the booking of 46,000 tons of Open Hearth Rails for the Louisville & Nashville by the Tennessee Coal, Iron, & Railroad Company are the important events of the week. The Tennessee Company's price was \$30, or \$1 a ton advance over the basis on which it took business for 1907. The Monterey, Fresno & Eastern Railroad, a new line, which will build about 200 miles of road this year, has bought 20,000 tons of Rails, which will be rolled at Buffalo. The Frisco system has placed 10,000 tons which, it is expected, will be rolled at South Chicago. Miscellaneous smaller sales amount to between 15,000 and 20,000 tons, making the week one of the best in new business in some time.

Structural Material.—Some of the mills report that the better rate at which business in Structural Shapes was coming to them 10 days ago has been maintained. The amount of business being figured on by fabricating companies is large, and while some projects on which bids had been asked have been laid aside, that is a feature always present, and actual bookings week by week are at a rate that has caused no concern as yet over anything that does not eventuate in a contract. The new subway contracts have been of increasing interest in the week. The general contract for the Manhattan loop connecting the Williamsburg Bridge and the Brooklyn Bridge was let last week. About 5500 tons of Steel will be required—3000 tons of Bars for reinforcing concrete and 2500 tons of Shapes. The bids for the first section of the new subway lines on Lexington and Eighth avenues and other routes is to be let to-morrow. The entire work will require 80,000 tons of Steel, about equally divided between Bars for concrete work and Structural Shapes. Less than 40 per cent. of the Shapes will require to be put through a bridge shop. In the past week the American Bridge Company has taken considerable mining, cement and other light structural work. For a smelter at Ely, Nev., for the Nevada Consolidated Copper Mining Company, 1200 tons of Steel will be furnished by the American Bridge Company, as will also 800 tons for the Wisconsin Steel Company's (International Harvester Company) new blast furnace plant at South Chicago. For the Chicago, Lake Shore & Eastern, 3000 tons of bridge work is still pending, and a considerable amount of mining erection is being figured on. We continue to quote tide-water deliveries, shipments from mill, as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—With a rather limited demand, prices of Bar Iron have shown some tendency toward a lower level. This, however, is indicated more in connection with offerings for future delivery than for early shipment. Mills quoting for delivery within the next four weeks are asking from 1.84½c., tidewater, up to 1.85c. at mill, while those soliciting business for longer deliveries appear willing in some cases to take orders at 1.80c., tidewater. The Steel Bar situation is rather stronger than Bar Iron, Soft Steel Bars being quoted at 1.84½c. to 1.89½c., tidewater.

Plates.—The market is somewhat easier, particularly on Tank Steel, on which some of the Western mills are now able to make deliveries in four to six weeks. This is naturally expected to have a tendency to bring the prices of Eastern and Western mills somewhat closer together. Not much business is being placed at present, orders from local buyers being confined to small lots. Quotations for tidewater delivery are as follows: Sheared Tank Plates, 1.84½c. to 2.04½c.; Flange Plates, 1.94½c. to 2.14½c.; Marine Plates, 2.24½c. to 2.34½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Current business is confined to small lots. Inquiries are light, which is probably due as much to the unfavorable weather as any other influence. The largest inquiry in the market is for 15 miles of Gas Pipe from a new company in Connecticut. A rather good volume of export business is now being done, as some foundries have foreign Pig Iron on hand, which they can run into Pipe in filling such orders and thus secure the benefit of drawback of duty. The Eastern foundries are so well filled with work

running into the summer that prices are strongly maintained at \$35.50 to \$36 for 6-in. per net ton at tidewater.

Old Material.—Sales are reported of Heavy Melting Steel Scrap at full prices. The market for this class of material, therefore, seems to be well maintained. The demand for Heavy Cast Scrap, Stove Plate, Wrought Pipe, Cast Borings, Grate Bars and Heavy Steel Turnings is active, and prices are strong. Shippers are behind in their contracts, even the largest dealers having been unable to keep up to their engagements, and buyers are urging more prompt delivery. In the case of Steel Scrap an actual scarcity prevails at most mills. Wrought Scrap is the only commodity in ample supply. General conditions are not only satisfactory, but they are so much better than had been anticipated they would be by this time that dealers express great confidence in the immediate future. Quotations per gross ton, f.o.b. New York, are as follows:

Old Glider and T-Rails for Melting	\$16.00 to \$16.50
Heavy Melting Steel Scrap	16.00 to 16.50
Old Steel Rails, rerolling lengths	18.00 to 19.00
Relaying Rails	27.00 to 28.00
Old Iron Rails	23.50 to 24.00
Standard Hammered Iron Car Axles	28.50 to 29.00
Old Steel Car Axles	20.50 to 21.00
No. 1 Railroad Wrought	19.00 to 19.50
Iron Track Scrap	17.50 to 18.00
No. 1 Yard Wrought, long	17.50 to 18.00
No. 1 Yard Wrought, short	17.00 to 17.50
Wrought Pipe	14.50 to 15.00
Light Iron	11.00 to 11.50
Cast Borings	12.50 to 13.00
Wrought Turnings	14.50 to 15.00
Old Car Wheels	22.00 to 22.50
No. 1 Heavy Cast, broken up	19.00 to 20.00
Stove Plate	16.00 to 16.50
Grate Bars	14.00 to 14.50
Malleable Cast	19.50 to 20.00

The Lackawanna Steel Company has removed its main offices from 100 Broadway to the eighteenth floor of the United States Express Company's Building, 2 Rector street, New York.

Metal Market.

NEW YORK, April 17, 1907.

Pig Tin.—The market continues dull, price fluctuations being small. On April 11 sales were made at 40.70c., and on April 12 the price declined to 40.55c. The following business day, April 15, the largest transaction of the week occurred, amounting in all to about 150 tons, the quotations being 40.35c. for car lots and 40.40c. for 5-ton lots. This good business caused an advance in the London market the following day, consequently prices were raised to 40.50c., and in some cases higher. Business, however, was almost at a standstill. To-day the London market closes at £185 2s. 6d. for spot and £183 2s. 6d. for futures; prices in New York are unchanged at 40.50c. The arrivals have been large, amounting in all to 2105 tons, and there are afloat 1564 tons, of which 500 tons at least will make this month's delivery.

Copper.—The market continues largely nominal, but there are several cross currents in trading, the larger American interests continuing to hold prices firm and unchanged, having sold a large part of their production some weeks ago. Business in Lake and Electrolytic Copper, however, is practically at a standstill, and the views of buyers and sellers as to prices are at considerable variance. The Lake market could be represented at 24.50c. to 25.50c., although it would be as difficult for a buyer seeking Copper to buy at the inside price as for a seller who desires to dispose of Copper to secure the outside price. Electrolytic is unchanged, at 24c. to 25c., but sales have been made near the outside figure. The weakness, as has been apparent for some weeks, is specially pronounced in the matter of Casting grades, and this class of Copper can be had at 22.75c. to 23.25c. A sale of remanufactured Copper was made during the week at considerably below these figures, but this is scarcely a criterion for regular Casting grades. The statistics of the English market issued April 16 show that during the first 15 days of April stocks decreased 730 tons and afloats decreased 490 tons, the total visible supply being 13,780 tons, a decrease of 1220 tons. This was largely responsible for the strength shown in the English market on that day. There is, however, an unusually large difference between the price of Standard and Best Selected Copper, which corresponds with the wide discrepancy between the prices of Casting and Electrolytic Copper in this country, which runs usually from ¼c. to ½c. per lb. and is now from 1¼c. to 1½c. The London market has advanced sharply, closing to-day at £98 10s. for spot and futures and £100 for Best Selected. There is no doubt that there is a slowing down of activity in Europe, but whether the statistics of L. Vogelstein & Co., American representatives of Aron Hirsch & Sohn, Halberstadt, which indicate a consumption during January and February, 1907, of 16,440 tons, as against a consumption during the same period in 1906 of 20,261 tons, represent a greater falling off than is actually the case, cannot be arrived

at so readily. Sufficient to say, these statistics, which are carefully compiled, show the trend of the market. American consumers continue exceedingly optimistic, and as they have sold a large portion of their Copper for May and June shipment, as well as some for July, there is no need for haste in the matter of revising prices. It would not be surprising, however, to find that some of the larger companies have been taking a more active interest in the market than now seems apparent. Shipments to smelters continue large, even the recent heavy snowstorm in Michigan having interfered but little with the shipment of Copper from the mines in that district. This storm crippled only one of the roads in the peninsula, but as the ground underneath was not frozen it is expected that traffic will be resumed shortly, if it has not been done already. Deliveries of ingot metal are excellent; in fact, some users of Copper are requesting delays.

Spelter.—The local market is quiet, and prices are easier in New York at 6.80c. to 6.85c. The St. Louis market continues dull at 6.65c. to 6.70c. Prices for Spelter in Europe show a decline of 12s. for the week, being quoted to-day at £25 10s.

Ferroalloys.—There is a better understanding regarding the prices of Ferromanganese, and although sales have been light this is a desirable feature, owing to the limited stock in this country. The price for spot delivery is firm at \$70, and futures can be had at \$68, Baltimore. Ferrosilicon is unchanged at \$110 for spot, and \$108 for futures.

Tin Plate.—Some improvement has been noted in the demand from consumers, which is also observed in other lines of finished product. Prices are unchanged at \$4.09, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh.

Pig Lead.—The pressure to sell, which was in evidence a fortnight ago, has to a large extent disappeared, but quotations are practically unchanged at 5.95c., St. Louis. Sales have been made in that market, however, at 6c. Spot shipments in New York can be had at 6.12½c. to 6.15c. The leading producer has made considerable improvement in the matter of deliveries, and shipments are now made within four to five weeks after the receipt of order. Terms continue unchanged at the price current on date of shipment, and the price of 6c. governs outstanding contracts. The European market is quite bare of stocks, and the London market advanced sharply to-day to £20 2s. 6d.

Antimony.—Weakness continues in this market, advices from Europe being to the same effect. Cookson's Antimony is practically unchanged at 24c. to 24.50c., Hallett's at 22c. to 22.50c., while outside brands can be had at 20.25c. to 20.75c.

Old Metals.—The following dealers' selling prices are more or less nominal, owing to the small amount of business:

	Cents.
Copper, Heavy and Crucible.....	22.00 to 22.50
Copper, Heavy and Wire.....	21.75 to 22.25
Copper, Light and Bottoms.....	19.50 to 20.00
Brass, Heavy.....	15.25 to 15.75
Heavy Machine Composition.....	18.25 to 18.50
Clean Brass Turnings.....	14.00 to 14.50
Composition Turnings.....	16.75 to 17.25
Lead, Heavy.....	5.75
Lead, Tea.....	5.45
Zinc Scrap.....	5.00

Henry R. Merton & Co., London, figure the world's production of Copper outside of the United States during 1906 as 303,200 tons, being a slight increase over 1905, when the production was 293,000 tons. In 1904 and 1903 the production outside the United States was 279,000 tons and 237,200 tons, respectively. During 1906 moderate gains were shown in Australia, Japan and Russia. A gain of 25 per cent. was noted in Canada, while in Chili there was a falling off of approximately 3000 tons. A similar falling off was also noted in Germany, but the production during the year 1905 in Germany was exceptionally large, amounting to 22,000 tons. In Mexico a falling off of about 4000 tons was noted. The production in Spain showed an increase compared with 1905, but compared with previous years the falling off continues. This is largely brought about through the running out of the Tharsis mine. Production of the Rio Tinto continues remarkably steady, it being 34,100 tons during 1906.

Emil Baerwald, representing Lewis Lazarus & Son, London, will remove on April 20 from 100 Broadway, New York, to 2 Rector street.

Iron and Industrial Stocks.

NEW YORK, April 17, 1907.

The improving tendency in stock values which was noticed in our last report was not maintained. General recessions occurred. The lowest values were realized on Monday of this week when considerable pressure was exerted on many stocks, and in some of them appearances of liquidation were manifested. This downward movement was not attributed to any specially unfavorable cause outside of the fact that somewhat unsatisfactory reports were current regarding the winter wheat crop. The range of prices on active stocks from Thursday to Tuesday was as follows:

United States Steel common 35¾ to 39¾, preferred 98¾ to 101¼; Car and Foundry common 35¾ to 38¾; Locomotive common 60¾ to 65¼; Colorado Fuel 34¾ to 36¾; Pressed Steel common 34¾ to 37½; Railway Spring common 43¾ to 45; Republic common 27¾ to 31¼, preferred 83 to 88; Sloss-Sheffield common 52½ to 55¼; Cast Iron Pipe common 35 to 36¾; Can preferred 57 to 60½. Some improvement occurred on Tuesday, when a portion of the decline was recovered. Last transaction up to 1.30 to-day are reported at the following prices: United States Steel common 37, preferred 100¾; Car & Foundry common 37, preferred 99; Locomotive common 62¾, preferred 105; Steel Foundries common 8¾, preferred 39; Colorado Fuel 34¾; Pressed Steel common 36, preferred 94; Railway Spring common 43¾; Republic common 29, preferred 84¾; Sloss-Sheffield common 53; Tennessee Coal 145¾; Cast Iron Pipe common 36, preferred 80½; Can common 6¾, preferred 57.

The Crescent Coal Company, Pittsburgh, has called for the payment at the office of the Union Trust Company, trustee, of all its outstanding bonds secured by its mortgage dated May 1, 1901.

Dividends.—The Warwick Iron & Steel Company has declared a semiannual dividend of 3 per cent., payable May 15.

The British Pig Iron Market.

Reports of the British Iron market under date of April 4 say that the beginning of new buying had then appeared, and that further Pig Iron orders had been received from the United States, while the German and Italian demand showed expansion. The hope was expressed that bear operations in the warrant market would cease and that legitimate conditions would be allowed to govern. Middlesbrough reported that the production of Cleveland Pig Iron was the heaviest on record, and still the output was not equal to requirements. The stocks in Connall's stores decreased 37,257 tons in March, and in the first quarter of the year the decrease was 80,335 tons, the total of No. 3 Iron in store at the end of March being 440,469 tons. As compared with the close of March, 1906, this represents a decrease of 269,216 tons. The shipments of Pig Iron from the Cleveland District in March were 146,978 tons, exceeding the best previous record, that of November, 1906, by 2237 tons. The exports from the Cleveland District for the first quarter of the year were 404,870 tons, as compared with 295,938 tons as the best previous record, which was made in 1905.

A good effect was produced by the receipt of further Pig Iron orders from the United States, the first week in April showing purchases both of Scotch and Cleveland Pig Iron by American consumers. No. 3 Cleveland G.M.B. Pig Iron advanced in the first week of April to 54s. 6d. per ton for early delivery.

Drawback on Aluminum Products.—The Treasury Department announces that the regulations heretofore issued establishing a rate for the allowance of drawback on sheets, bars, plates and tubing manufactured by the Pittsburgh Reduction Company, now the Aluminum Company of America, Pittsburgh, Pa., wholly from imported aluminum in the pig, are hereby extended, so far as applicable, to cover the exportation of castings, bare and insulated wire or cable, rivets and other articles manufactured by that company from imported material in accordance with its sworn statement. In liquidation, the quantity of imported aluminum in the pig which may be taken as the basis for the allowance of drawback may equal the quantity stated in the drawback entry after official verification of exported quantities, provided the same shall not exceed the net weight of the exported articles, with an addition thereto not to exceed 1 per cent. thereof to cover worthless waste.

Chromite in the Transvaal.—A correspondent at Johannesburg says that much interest has been shown in mining circles in the recent discoveries of chromite in the Transvaal. As the mineral has been discovered in a district served by the railroads—in some places in the immediate neighborhood of the line—and as the values appear to be fairly high, immediate developments may be looked for. Chrome steel shoes and dies have been experimentally installed recently in South African batteries; so far, while the results have in some instances shown that more care is needed in manufacture to obtain a uniform grade of product, the experiment has demonstrated that chrome steel is suited to the requirements of the mining companies. The representative of American manufacturers of chrome steel shoes and dies recently spent some months in the region.

Advanced Freight Rates.

Effective June 1, 1907, freight rates per ton on pig iron, billets and cinder shipped from Pittsburgh will be advanced as follows:

Pittsburgh to—	Pig iron.	Billets.	Cinder.
New York.....	\$2.45	\$2.60	\$2.45
Baltimore	2.15	2.30	2.15
Philadelphia	2.25	2.40	2.25
Buffalo	1.75	1.80	1.55
Rochester	1.80	1.90	1.80
Syracuse	2.10	2.20	2.10
Utica	2.30	2.40	2.30
Richmond, Va.....	2.65	2.80	2.65
Williamsport, Pa.....	2.05	2.20	2.05

On and after June 1 the rate on coke from the Connellsville region to Pittsburgh will be 75 cents; to the Mahoning and Shenango valleys, \$1.35; Canal Dover, Ohio, \$1.45; Midland, Pa., 97 cents; Cleveland, \$1.65, and to Ohio River points, which include Wheeling, Mingo Junction and Bellaire, \$1.30. The rate on cinder from Pittsburgh to the Mahoning and Shenango valleys will be 75 cents, pig iron 90 cents and billets \$1. From Pittsburgh to the Wheeling District the new rate on cinder will be 75 cents, pig iron 90 cents, billets \$1, and from Pittsburgh to Steubenville, Ohio, the rate on cinder will be 70 cents, pig iron 80 cents and billets 90 cents.

Effective June 1, freight rates on pig iron and billets will be advanced from 5 cents to 15 cents a ton or more, as follows:

To—	From— Pittsburgh and Wheeling		Beaver, Steubenville and Buffalo.		Youngstown.	
	Bil- lets.	Pig Iron.	Bil- lets.	Pig Iron.	Bil- lets.	Pig Iron.
Adrian, Mich.....	\$2.40	\$2.20	\$2.40	\$2.20	\$1.90	\$2.00
Akron, Ohio.....	1.50	1.40	1.20	1.05	...	1.00
Alliance, Ohio.....	1.10	1.05	1.05	.95	...	...
Alton, Ill.....	3.70	3.40	3.70	3.40	3.70	3.30
Anderson, Ind.....	2.60	2.20	2.60	2.20	2.70	2.30
Ashtabula, Ohio.....	1.50	1.40	1.60	1.45	...	1.00
Bucyrus, Ohio.....	1.90	1.60	1.90	1.60	2.00	1.75
Buffalo, N. Y.....	1.80	1.75	1.80	1.75	...	1.50
Cambridge, Ohio.....	1.20	1.10	1.00	.90	2.05	1.95
Canal Dover, Ohio.....	1.20	1.10	1.00	.90	1.80	1.75
Chicago, Ill.....	3.00	2.80	3.00	2.80	3.00	2.80
Cincinnati, Ohio.....	2.40	2.20	2.40	2.20	2.55	2.30
Cleveland, Ohio.....	1.50	1.40	1.50	1.40	...	1.00
Columbus, Ohio.....	1.90	1.60	1.70	1.50	2.20	1.90
Conneaut, Ohio.....	1.50	1.40	1.60	1.45	...	1.00
Connellsville, Pa.....	.95	.85	1.45	1.35	2.10	1.95
Coshocton, Ohio.....	1.35	1.15	1.00	.90	2.05	1.95
Dayton, Ohio.....	2.20	1.85	2.20	1.85	2.40	2.00
Detroit, Mich.....	2.25	2.15	2.25	2.15	1.95	1.75
Dunkirk, N. Y.....	1.80	1.75	1.80	1.75	...	...
East St. Louis, Ill.....	3.70	3.40	3.70	3.40	3.70	3.30
Erie, Pa.....	1.50	1.40	1.60	1.50	...	1.00
Findlay, Ohio.....	2.00	1.75	2.00	1.75	2.00	1.75
Fort Wayne, Ind.....	2.40	2.00	2.40	2.00	2.40	2.00
Grand Rapids, Mich.....	3.00	2.80	3.00	2.80	2.90	2.80
Huntington, W. Va.....	2.30	2.10	2.00	1.90	2.45	2.25
Indianapolis, Ind.....	2.65	2.20	2.65	2.20	2.75	2.30
Jamestown, N. Y.....	1.80	1.00	1.20	1.10	...	...
Joliet, Ill.....	3.00	2.80	3.00	2.80	3.00	2.80
Kewanee, Ill.....	3.40	3.20	3.40	3.20	3.40	3.20
Lansing, Mich.....	2.80	2.70	2.80	2.70	2.80	2.40
Latrobe, Pa.....	.70	.60	1.20	1.10	1.80	1.75
Lima, Ohio.....	2.20	1.75	2.20	1.75	2.20	1.80
Louisville, Ky.....	3.00	2.80	3.00	2.80	3.00	2.90
Mansfield, Ohio.....	1.80	1.50	1.70	1.50	1.80	1.60
Marion, Ohio.....	1.60	1.50	1.30	1.25	2.20	2.10
Marion, Ohio.....	1.90	1.60	1.90	1.65	2.00	1.70
Meadville, Pa.....	1.40	1.30	1.60	1.45	...	1.00
Mount Vernon, O.....	1.80	1.50	1.70	1.50	2.10	1.90
Newark, Ohio.....	1.65	1.30	1.35	1.20	2.10	1.90
Newcomerstown, O.....	1.20	1.10	1.00	.90	2.05	1.95
Oil City, Pa.....	1.40	1.30	1.60	1.45	...	1.00
Parkersburg, W. Va.....	1.60	1.50	1.10	1.10	2.20	2.10
Port Huron, Mich.....	2.80	2.70	2.80	2.70	1.95	1.80
Portsmouth, Ohio.....	2.30	2.10	2.30	2.10	2.45	2.25
Richmond, Ind.....	2.40	2.10	2.40	2.10	2.50	2.20
Springfield, Ill.....	3.70	3.40	3.70	3.40	3.70	3.30
Steubenville, Ohio.....	.90	.80	.45	.30	1.80	1.75
St. Louis, Mo.....	3.80	3.50	3.80	3.50	3.80	3.40
Terre Haute, Ind.....	3.00	2.80	3.00	2.80	3.00	2.80
Tiffin, Ohio.....	1.95	1.70	1.95	1.70	1.95	1.60
Titusville, Pa.....	1.50	1.40	1.70	1.55	...	1.00
Toledo, Ohio.....	1.95	1.75	1.95	1.75	1.95	1.60
Vincennes, Ind.....	3.00	2.90	3.00	2.90	3.20	3.00
Warren, Pa.....	1.80	1.75	1.80	1.75	1.40	1.45
Washington, Pa.....	.70	.60	.70	.60	1.80	1.75
Wheeling, W. Va.....	1.00	.90	...	...	1.80	1.75
Wooster, Ohio.....	1.50	1.40	1.40	1.20	1.80	1.60
Youngstown, Ohio.....	1.00	.90	1.05	.95	1.50	1.40
Zanesville, Ohio.....	1.50	1.20	1.00	.90	2.10	2.00

Recent Customs Decisions.

The Duty on Zinc Ore.

The dispute between the Government and the importers of zinc ore regarding the classification to be awarded the product reached the United States Circuit Court at Houston, Texas, April 2, when arguments were heard by Judge Burns. The case was only decided by the Board of General Appraisers on February 11, and its speedy hearing by the court is unusual. When the case was before the lower customs tribunal there were protests from many sections of the country, and an attempt was made by the board to decide all of the points at issue, but without success. It was determined, therefore, to make an importation owned by C. G. Brewster and entered at Laredo the test suit in the courts, as the protest seemed to present all the points it is desired to settle.

Counsel for the importers maintained that the decision of the Board of Appraisers should not be disturbed and should be affirmed. On the other hand, the Special Assistant United States Attorney asked for the reversal of the board's ruling. He insisted that the concentrated ores (sulphides) cannot possibly be classified under paragraph 614 of the Dingley law, free of duty, because they have been "advanced in value or condition by refining or grinding or by other process of manufacture." Also that the same is true of the other ores, which have all been crushed and hand picked. Stress was laid upon the contention that all of the ores are properly dutiable at 20 per cent., either on their entire value or on the value of all but the lead contents, if any, either directly or by similitude as "metallic mineral substances," under paragraph 183, or as nonenumerated articles partly manufactured under section 6 of the law. The court reserved decision.

Old Electroplates.

By an inadvertence the Nassau Smelting & Refining Works, New York, was on April 6 called upon by the Board of United States General Appraisers to pay a higher duty on old electroplates than that originally assessed by the Collector of Customs. The articles contain 90.74 per cent. of lead and are fit only for remanufacture, duty at the rate of 2½ cents per pound being levied. The importers objected to this classification, and filed a protest in which claims were made for free entry, or else the imposition of ad valorem duties of either 20, 25, or 45 per cent. After considering the evidence the board holds that the collector erred in his official return and should have assessed the plates at 45 per cent., this action resulting in the payment of duties in excess of those first exacted. It is supposed that the claim for the 45 per cent. rate was unintentionally included in the official protest.

Diamonds Imported for Industrial Purposes.

The Board of United States General Appraisers handed down a decision April 6, in which it was held that diamonds imported for industrial purposes are entitled to free entry under the tariff act. The Government has assessed the articles under the provision in the law for "diamonds advanced in condition or value," calling for a 10 per cent. tax. The General Electric Company, which is a large importer of the stones for use as bearings of electric motors, decided to challenge the action of the customs authorities, and the suit was therefore instituted.

Some of the testimony submitted to the board was to the effect that by reason of the continuous advance in the price of all grades of diamonds during the last 10 years the better qualities of bort, capable of being cut into the form of rose diamonds, would now be excluded from the trade designation of bort. The decision remarks, however, that the preponderance of the evidence shows that at the present time the articles in the condition imported would not be known as rose diamonds, nor can they be commercially cut and adapted to jewelry purposes in this country. It is sufficient in the opinion of the General Appraisers that the articles were recognized in the trade in 1897 as bort. It is understood that the diamond cutting industry of the country desired the imposition of the duty.

The Machinery Trade.

NEW YORK, April 17, 1907.

The demand for machine tools continues strong, especially for early delivery, the main difficulty being to get tools to sell. On account of the scarcity of machines that can be had within the next few months, intending buyers are compelled to shop around a great deal, and this, no doubt, makes the demand appear to be larger than the actual combined requirements. There is no question that the demand is greater than the supply, and that a larger business would be done if the dealers could get the machines to sell. The fact that machinery of standard make cannot be delivered for months to come is now pretty well known throughout the country, and as a consequence the inquiries are generally for small lots, the buyers hoping in this way to secure the required tools from various companies. Thus the orders also call for only a few tools. The more important users of machine tools, with few exceptions, have not yet come into the market except for a few tools for immediate use. It is claimed by some in the trade that the extended deliveries and high prices are causing the withholding of extensive requirements, as many prefer not to place orders now for machines that cannot be delivered within a year, not knowing how business will hold up. As a result of these conditions inquiries the past week have fallen off a little.

Machinery men whose equipment is more particularly designed for use in railroad shops are noting a decrease in business during the last few weeks, and the number of inquiries is accordingly light. In addition to the cancellations from the Erie list, there has come to the trade numerous cancellations of scattered orders for shop equipment which was intended for additions to existing car shops on various lines. These scattered cancellations are in most cases the result of reconsideration on the part of shop superintendents, who have been informed that their requirements must be curtailed for a time, and such orders have necessarily resulted in the shop officials changing their plans to an extent.

At a meeting of the General Committee appointed from the representatives of the metal and machinery trades of New York, held on Wednesday, April 10, in the office of the Watson-Stillman Company, 26 Cortland street, to complete the organization of a metal and machinery club, committees were appointed to formulate by-laws and arrange for the incorporation of the club. The Incorporation Committee, which was appointed by F. H. Stillman, chairman of the General Committee, consists of H. C. Hunter of the National Metal Trades' Association; R. C. McKinney, Niles-Bement-Pond Company; John Derby, Manning, Maxwell & Moore; William Hoxie, Babcock & Wilcox Company, and W. P. Pressinger, Chicago Pneumatic Tool Company. The Committee on By-Laws consists of James R. Vandyck, Vandyck-Churchill Company; Thornton N. Motley, T. N. Motley & Co.; George A. Howells, Ingersoll-Rand Company; George E. Molleson, Tyler Tube & Pipe Company, and Percy A. Ware, *The Iron Age*. On motion of Mr. Molleson, Mr. Stillman was requested to take an active part in the deliberations of the two committees.

Carnegie Steel Company's Newark Plant.

Plans have been filed with the Building Department of Newark, N. J., for the warehouse and other structures to be erected in that city by the United States Steel Corporation, through the Carnegie Steel Company. The company has planned to erect four buildings at present, one of which will be 420 x 525 ft. with a wing 140 x 220 ft. This structure will be used for the handling of shapes and plates and some equipment will be installed in the structure for the purpose of fabricating beams and other structural steel and cutting to size. There will be another warehouse, 125 x 500 ft., which is to be used for storing bars, sheets, tin plate, &c. There will be a power house, 90 x 105 ft., and it will be equipped with 1000 hp. of boilers, a 500-hp. engine and 400 kw. of generators. There will be an office structure, 50 x 100 ft. and two stories in height. Work on the erection of the buildings has already been begun. They will be of steel and concrete construction. Considerable conveying machinery will be required for equipping the storage plant, and from all accounts this has not as yet been purchased. It is expected that the crane trade will get some specifications shortly for some particularly heavy cranes for handling the structural material.

For some time we have noted the extensive additions to be made to the plant of the Standard Roller Bearing Company, Philadelphia, Pa., which has purchased a great deal of machinery the past year for equipping the numerous extensions. The company is now in the market for four horizontal boring and drilling machines, five gear shapers for spur gears, four beveled gear cutting or milling machines, one radial drill, two 200-lb. drop hammers, two cold saw

presses for making pressed steel parts and four milling machines. The work of new construction and equipment is in charge of S. S. Eveland, vice-president and general manager.

The Federal Railway Signal Company, 60 Wall street, New York, has been purchasing of late to equip shops at Albany, N. Y., to take the place of its machine shop at Troy, N. Y., which was destroyed by fire on January 31. The company has bought the property of the Albany Forge Company, located on the New York Central & Hudson River and the Delaware & Hudson railroads. The Albany Forge Company owned a completely equipped machine shop, pattern and carpenter shop and storeroom, and those facilities together with machinery recently purchased will enable the company to commence at once the manufacture of signal apparatus to a greater extent than it could prior to the fire. Meantime some part of the manufacturing will be done in Troy, N. Y., principally the foundry and blacksmith work. The Albany shops are located on a tract of 19 acres of land, and there is ample room for extensions, some of which are already being arranged. The company expects to build during the summer an additional two-story building, 100 x 350 ft., to be used as a machine shop, and a structure, 60 x 150 ft., which will be utilized as a foundry. On the completion of these buildings the offices, the foundry and blacksmith shop will be moved from Troy to the new location. P. G. Ten Eyck is treasurer and chief engineer.

During the past few days the General Electric Company has been placing orders for considerable machinery. The company is making a number of important improvements to its plants, which, with the requirements for the new plant to be erected at Erie, Pa., will necessitate the purchase of a large amount of additional machinery.

The Dahlstrom Metallic Door Company, Jamestown, N. Y., contemplates the purchase of the following machinery for equipping the additions it is making to its plant: One 250 hydro electric power unit, direct connected; three motors aggregating 100 hp., a 100 to 150 hp. steam plant, one 40 to 50 hp. second-hand steam engine, lathes, drills, emery grinders, light and heavy presses. The buildings in which this equipment is to be installed will be the one now in course of erection, 60 x 135 ft., four stories high, and another 64 x 160 ft., four stories high. These buildings will nearly triple the capacity of the original plant for the manufacture of Dahlstrom patent sheet metal doors and accessories.

The American Brass & Copper Company, 193 Centre street, New York, has prepared plans for a new plant to be built on the southwest corner of Howard and Lafayette streets. The Murphy Construction Company, 5 East Forty-second street, will erect the building, which will be an 11-story and basement structure, with a frontage of 100 ft. on Lafayette street and 87 ft. on Howard. The structure will be fireproof throughout and the outside finish will be of limestone for the first two stories and light brick and terra cotta above. The building will contain two elevators and a power plant of from 350 to 400 hp. When the new structure is completed the company will move its machinery from its present quarters at 193 Centre street, but it is understood that some purchasing of machinery equipment will be done. It is expected that the building will be completed during the summer. The company makes a line of brass and copper specialties, such as gas fixtures and the like.

There are inquiries in the market for equipment for the Hall Signal Company, 25 Broad street, New York, whose plant at Garwood, N. J., is to be about doubled in size, according to present plans. Just what is to be done at present in the way of improvements there has not been clearly outlined, as the company is so rushed with work that it cannot afford to interfere with its present manufacturing equipment. It has been decided, however, that the company's manufacturing facilities must be doubled in order to cope with the existing demand. The plant at present, which is devoted to the manufacture of railroad switches and signal equipment, is about 100 x 300 ft. It is expected that the improvements will be entirely arranged for this spring.

The Engineering Specialty Company, 143 Liberty street, New York, is erecting a plant at South street, Stamford, Conn., the main building of which will be 40 x 100 ft. The company has not worked out the details regarding the rest of the plant and the machinery equipment as yet, but later on will be in a position to announce something regarding that feature of the project. The company has offices at San Francisco, Baltimore and Philadelphia, and manufactures motors and generators and other electrical and mechanical specialties.

The Pittsburgh Water Heater Company, recently organized at Pittsburgh with a capital of \$250,000, has purchased a building in that city in which it will install machinery for the manufacture of a patented water heater. R. C. Framp-ton, formerly secretary and sales manager of the Ruud Mfg. Company, is president and manager, with offices in Room 510 Columbia Bank Building, Pittsburgh. A number of machine tools are to be purchased for the new works.

Plans are fast approaching completion for the erection of the car building and woodworking plant at Halifax, N. S., in which Silliker & Co., Limited, Amherst, N. S., are the main factors. The company, which is to be known as the

Silliker Car Company, has just been incorporated with a capital stock of \$500,000, the incorporators being C. J. Silliker and E. E. Silliker, of Amherst; A. M. Bell, G. S. Campbell, W. J. Clayton and H. McC. Hart of Halifax. C. J. Silliker has been elected president and managing director, and E. E. Silliker, secretary and treasurer. The Messrs. Silliker and H. McC. Hart compose the Executive Committee. Some time ago a large site was secured and preparations made for beginning the construction of a plant which is to cover three acres of ground and to cost about \$200,000. The present woodworking plant of Silliker & Co. is to be moved from Amherst to the new location, and to this plant is to be added a department for the manufacture of freight cars. The work of excavating for the foundations will begin shortly, and the plant completed at as early a date as possible.

Power Equipment for the Hudson Companies' Terminal.

Inquiries are being sent out by the Fuller Construction Company for power equipment, to be installed in the Church Street Building of the Hudson & Manhattan Railroad Company, which will constitute the terminal of the Hudson Company's tunnel under the Hudson River. The company is asking for bids on two 480-hp. engines, and it is understood that later additional inquiries for power equipment will come before the trade, as what is claimed will be the largest electric storage battery in the world will be installed in the structure, and considerable will be needed, it is thought, in the way of coal handling machinery, boilers and other power plant equipment. The Hudson Company has been buying a quantity of machinery equipment of late through its purchasing department, principally for temporary use in connection with its tunnel work. The company, it is understood, will shortly install a blacksmithing department and temporary repair shop in Jersey City for the repairing of equipment used on the tunnel work.

There are a number of inquiries in the market for equipment, principally in the construction and power line, from the McCall's Ferry Power Company, 60 Wall street, New York. It is understood that the company has a large power project under way at McCall's Ferry, Pa., but no statement will be made as yet as to the extent of its plans.

The International Time Recorder Company, 183 Water street, Binghamton, N. Y., has inquiries out for the power equipment for an addition to its plant at Endicott, N. Y. The company will install about 300 hp., and the inquiries state that bids on Corliss engines are preferred.

The Yonkers Board of Water Commissioners has awarded a contract to the Atlas Engine Company for two 225-hp. boilers.

It will be remembered that several weeks ago it was mentioned in these columns that there was a large amount of Japanese business before the trade, and this fact is indicated in the number of orders for power equipment which have been closed of late by the Hooven-Owens-Rentschler Company for delivery in that country. Among the orders placed was one for four duplex heavy duty variable speed engines for the Oji Paper Company of Japan, and other orders for Japanese interests placed with this company include a 400-hp. cross compound condensing belted engine, 150-hp. belted engine and two 750-hp., two 400-hp. and two 350-hp. simple engines. The business landed by this company for engines alone is a good illustration of the extensive demand for machinery equipment from Japanese interests, as it is understood that most of the orders for the machinery for the enterprises this power apparatus is intended for came to this company through the Japanese purchasing houses.

But two bids were submitted for the construction of the Subway loop between the East River bridges. These were the Degnon Contracting Company, which agrees to do the work for \$2,952,000, and the Cranford Company, New York, whose bid was \$3,775,000. A meeting of the Rapid Transit Commission is to be held on Friday, at which it is believed the contract will be awarded to the Degnon Company, which was the lower bidder.

Bids will be received on Thursday, April 25, by the Commissioner of Bridges of New York at his office, 13-20 Park row, for installing the ventilating system and electrical equipment for the Manhattan Subway station of the Williamsburg Bridge over the East River. The amount of security required is \$10,000, and it is stipulated that the contractor must begin work within five days of the date the contract is certified, and the installation must be completed by August 30.

Business Changes.

The New York branch of the Green Fuel Economizer Company has moved to the new West Street Building, 90 West street, in common with many other large and well-known engineering firms. The new offices will be considerably larger than the old, in order to take care of the increasing business in economizers, fans, blowers and exhausters. Since entering the fan business this company has built many large fans for mechanical draft, including several with

overhung wheels, larger than any of this type ever built before. The company's New York representative is William Downs, who has occupied the old offices at 74 Cortlandt street since 1889.

The New York office of the Vandyck-Churchill Company will be moved about May 1 from 8 Dey street to 91-93 Liberty street, where the company will have added office space and better facilities for displaying and storing its line of machine tools and equipment.

The Pittsburgh Pneumatic Company, Canton, Ohio, manufacturer of pneumatic chippers, riveters and drills, has opened an office in room 60, Fidelity Building, Pittsburgh, in charge of Charles S. Rea.

A. Z. Boyd, who handles the New York selling business for the Wells Brothers Company, manufacturer of screw cutting tools and machinery, Greenfield, Mass., has moved from 56 Reade street to 126 Chambers street, where there is an enlarged and more attractive store space for displaying and storing equipment.

Chicago Machinery Market.

CHICAGO, ILL., April 16, 1907.

No material increase in inquiries or orders for machinery is discernable in any direction. There is, however, an undertone of developing strength noticeable that, though not yet manifest in concrete results, is thought to reflect a feeling of reassurance and renewed confidence in the general industrial situation. When news of wholesale cancellations by railroads and other interests first became current, it was naturally expected that congested order books would be relieved by withdrawals, and that remaining orders would accordingly be moved forward for advanced delivery. But since no such results have followed, either in machinery or other iron and steel products, the belief is growing that actual cancellations have either been of comparatively insignificant volume, or else have been speedily followed by requests for reinstatement. The fact too, that no sharply defined retrograde movement has followed the seemingly adverse developments of the past few weeks has had a salutary effect in dispelling gathering doubts as to the stability of industrial prosperity. It is reported that several contemplated new machinery equipments that have been held up through doubt and uncertainty will presently be put through, and will come into the market at an early date. A fair amount of business is being booked in heavy tools, and the leading dealers in boiler and structural shop equipment report a satisfactory volume of orders for single tools and light machines.

Interest is this week centered in the work of reorganization and practical reconstruction of Chicago's system of street railroads, that, following approval by a referendum vote at the recent city election of the new franchise ordinance, has been actively begun. Under the plans formulated in accordance with the provisions of the ordinance, and accepted by the street car companies, a sum aggregating more than \$50,000,000 will be spent in rebuilding existing lines, constructing extensions and furnishing new rolling stock and machinery equipment. Pending the long drawn out settlement of the traction question just reached, the car companies have been engaged in completing all preliminary arrangements so that the active work of construction might proceed as soon as legally authorized. Besides orders for 20,000 tons of rails for early delivery, a contract was this week placed with the National Brake & Electric Company, Milwaukee, Wis., for 300 complete air brake equipments, the outlay for which will closely approximate \$100,000. As rapidly as the work can be carried forward, the construction contemplated will require additional purchases of cars, car equipment, increased car repair and car building facilities, power generating machinery and appliances, all of which will involve large expenditures.

The organization of the Calumet Steel Company, Chicago, reference to which was made in last week's issue, has been completed by the election of the following officers: J. H. Porter, president; A. H. Hook, vice-president and treasurer; S. S. Porter, secretary. Plans are completed for the construction of a new bar and angle mill, and contract will be let within a few days for the buildings, which will be erected at Chicago Heights on a site recently purchased near the outer belt lines. The main building will be 60 by 450 ft., and other buildings will include a machine shop, boiler shop, engine room and warehouse, all of which will be of brick, stone and steel construction. The machinery equipment will be new and modern throughout. A three high train of rolls will be installed and the latest approved types and patterns of furnaces, shears, cranes, and supplementary machines will be selected. Water tube boilers in units of 250 and 200 hp., aggregating a total of 1200 to 1500 hp. will be installed, together with heavy duty engines

and compressors of corresponding capacity. It is the purpose to operate the machinery as far as possible in electrically driven individual units. Ground will be broken for the new buildings within a few days, and contracts for all of the machinery, none of which has been placed, will be let as soon as specifications are completed.

The Milwaukee Refrigerator Transit Company, Pabst Building, Milwaukee, Wis., has completed plans for and will at once commence the erection of a new car plant, consisting of an erecting shop 100 x 200 ft., besides a wood-working mill, blacksmith shop and machine shop. With the latest improved machinery the plant will have a capacity of 12 cars a day. A large amount of machinery will be required to equip these shops, which are designed to be made modern in every respect.

J. F. Dacey & Son, proprietors of the Gogebic Steam Boiler Works, on Lower Lake avenue, Duluth, Minn., are making improvements to their plant that will cost about \$50,000. A new building 80 x 100 ft. will be added. All required machinery, with the exception of electric crane equipment, has been purchased.

The steady development of water power facilities which abound throughout the West is noticeable in the number of such undertakings that are from time to time reported. Among those of notable importance is that of the Inland Power Company, Wallace, Idaho, which has been recently organized for the purpose of installing a hydraulic power plant on Bigg Creek, near Wardner, Idaho. The outlay for installation and equipment of the proposed plant is estimated at \$300,000, and it is stated that work upon the plant will go forward as rapidly as possible. No contracts for the necessary electric and hydraulic machinery have been placed, as plans for the plant and its equipment have not yet been fully completed. The officers of the company are S. P. Wright, president; W. H. Hall, vice-president, and G. Scott Anderson, secretary and treasurer.

The Northern Mountain Power Company, Eureka, Cal., that for a year and one-half has been operating an electric light and power plant at Junction City, furnishing 2000 kw. for power purposes to Eureka, now contemplates the installation of a hydraulic plant on the Trinity River, capable of furnishing an additional 15,000 kw. F. J. Koster is president and H. L. Jackman general superintendent.

A hydraulic water power plant will be installed at Cedar City, Utah, by the Cedar City Light & Power Company, recently incorporated with a capital stock of \$13,000. About \$6000 will be expended in the construction of a head race in which about 1000 ft. of 30-in. pipe will be used. Water will be conveyed to a Pelton wheel through 2000 ft. of feed pipe, with an effective head of 153 ft., and will drive a 90 kw. Warren generator. None of the equipment, it is understood, has been purchased.

Plans for the erection of a complete new power house by the Alliance Gas & Electric Company, Alliance, Ohio, have been revised, and it has been decided instead to remodel the present plant; the only new building to be erected will be a boiler house. The revised plans include the installation of new boilers and possibly one new generator and engine. Just how soon work upon these improvements will be started is not stated, but it is intended to be carried forward to completion during the present season. D. W. Louis is superintendent.

The Elberton Electric Light & Power Company, Elberton, Ga., is contemplating improvements to its lighting plant that will include the installation of a 150-hp. high speed engine and a two phase alternator of 2300 volts. Plans for the buildings necessary to accommodate this additional equipment are yet under advisement and have not been completed. G. W. Hubbard is the superintendent.

Following a recent decision of the Supreme Court affirming the validity of a \$600,000 issue of bonds for the extension of the Seattle municipal lighting plant, plans are being prepared for the contemplated improvements, which will be carried forward with as little delay as possible. A double transmission line will be installed, and the capacity of the present power plant will be doubled. It is expected that active construction work will be begun in the near future.

The city of St. Clair, Mich., is planning to improve its light and water plant by the installation of additional machinery. It has not been fully determined in detail what machinery and material will be required, further than that either steam or electrically driven pumps will be installed. Inquiries relative to the city's requirements should be addressed to J. C. Chamberlain, city clerk.

A bond issue of \$20,000 has been voted by the town of Cordell, Okla., for the purpose of extending the present water system and the building of a new electric light plant. Of this sum, \$12,000 is to be devoted to water works improvements, and \$8000 will be spent for boilers, engine and electrical machinery for the new lighting plant. It is expected that work on both systems will be carried to completion without delay. Inquiries relative to this work should be addressed to A. W. F. Lee, town clerk.

On May 1 the Chicago branch of Niles-Bement-Pond Company, the largest manufacturer of machine tools in the

world, will occupy its new offices on the sixth floor of the new Commercial National Bank Building, Clark and Adams streets, Chicago. In this building will also be located many of the large engineering and steel companies. The Pratt & Whitney Company will abandon its showroom and offices at 46-48 South Canal street and will combine its machinery sales department with that of Niles-Bement-Pond Company. The showroom and stock of Pratt & Whitney small tools and the small tool sales department will be located on the ground floor of the new Plamondon Building, Clinton and Monroe streets, where a complete line will be carried in stock. George F. Mills, who has for several years looked after the interests of these companies in the Chicago territory, will continue as manager of the offices.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 16, 1907.

There has been a material clearing in the atmosphere of the local machinery market during the past week. Buyers seem to have found their bearings on the situation in general, and less hesitancy is shown in placing orders for tools. Both manufacturers and dealers report a better demand. Recent orders have been almost entirely confined to single tools, but there has been a better sale of those of the larger sizes and heavier types than for some time. Several propositions for tools in quantity are still before the trade. From the best information we have, nothing has been finally decided upon in the way of the tool equipment of the new plant of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., although it is understood that orders have been placed for the major portion of the crane equipment and for the power equipment, comprising both engines and boilers. There are some good sized specifications before the trade from several of the railroads, and others are expected at an early date, but not a great deal of business is expected from this source at the present time.

Delivery features still continue the important factor in connection with the sale of machine tools, and in some cases it is to be noted that there has been quite an improvement in deliveries. These, however, are confined to a few sizes only, and no better delivery seems to be forthcoming as yet from tools of the larger sizes or heavier types. In some cases manufacturers find it impossible to get raw materials, while in others the scarcity of good mechanics interferes with the operation of the plant at its best capacity.

But little change is to be noted in the export demand. Orders for the general line of machine tools are not very plentiful, and in fact are not particularly sought after by builders in this territory, owing to the large volume of business on the books for domestic buyers. In special machine tools, however, quite a nice volume of business continues to be transacted, while the demand for machinery and power transmission specialties is reported fully up to the average.

Second-hand machine tools have been in very active demand, particularly those of the larger sizes, for which dealers say they find a ready sale if in good condition. In some cases good second-hand tools which have been taken in trade are to be found on machinery merchants' display floors. The demand for tools of the smaller sizes is not so good, the reason for this being no doubt that better deliveries can be had for new tools of this class than can be had for the larger and heavier tools.

Boilers and engines are in better demand. At this season of the year there is generally an increase in this branch of the business, and several propositions which have been under consideration for some time have been closed. Most of this business has been for equipment of the larger powers, medium powers being only in fair demand, while that for equipment of the smaller powers is dull.

There is practically no change in conditions governing the foundry trades. Practically all the foundries—gray iron, steel, malleable and brass—are fully occupied. Business continues to be offered in large quantities and deliveries are in many cases quite unsatisfactory to the consumer.

Charles J. Matthews & Co., leather manufacturers, 417 Arch street, are in the market for an air compressor, about 200 cu. ft. capacity, as well as a medium size lathe for use in connection with their manufacturing plant.

The Machen & Mayer Electrical Mfg. Company, a recently formed corporation with a capitalization of \$60,000, has begun the installation of a manufacturing plant at Twelfth and Buttonwood streets for the manufacture of a line of electric switches, plugs, &c. The major portion of the machinery equipment has been purchased, although additional tools will be added from time to time. The officers of the new corporation are: Charles H. Machen, president; Walter S. Mayer, general manager; Herman Horn, secretary, and James Brannen, treasurer.

The Northwestern Motor Car Company is erecting a garage at 1928-1930 North Twenty-second street. The build-

ing is to be 36 x 115 ft., two stories. It is understood that the new garage will be fully equipped for the usual work in connection with the automobile trade.

The Barrett Mfg. Company has had plans prepared by Ballinger & Perrot, engineers, for a new plant to be erected at Thirty-sixth and Wharton streets. The building will be 78 x 124 ft., two stories, the column, floor and roof construction to be of reinforced concrete. The new plant will be used for the further manufacture of the company's various roofing specialties.

It is understood that the Du Pont Powder Company, Wilmington, Del., has received a contract from the Brazilian Government to erect in that country a large powder manufacturing plant. The estimated cost of the proposed plant is said to be \$1,000,000.

The Espen-Lucas Machine Works has removed its offices and drawing room from its plant, 1341-1347 Noble street, this city, to the southeast corner of Fifteenth and Callowhill streets, which is adjacent to the plant, and where an entire building has been acquired. This change will enable the company to use the space formerly occupied for an addition to its machine shop. A number of orders have been booked for cold saw cutting off machines, crankshaft forming machines and boring mills, many of which are for those of the heavier types.

H. B. Underwood & Co., are busy in every department. The demand for portable tools continues large, both from foreign as well as domestic sources, particularly for boring bars, rotary planers and crank pin turning machines. Several boring bars have recently been exported to London, England, while quite a line of portable tools has been sold to Mexico. Most of the orders received have been for single tools, while the greatest proportion has been for those of the larger types. Industrial plants are becoming extensive users of these portable tools, and quite a number of boring bars have recently been sold to that class of customers.

New England Machinery Market.

WORCESTER, MASS., April 16, 1907.

An occasional buyer is holding off in placing orders for machine tools in the hope of a cut in prices, professing to believe that such a change must be the natural result of so protracted a period of high prices. The unanimous opinion of manufacturers and dealers is that the manufacturer who waits for lower figures will have quite a time ahead in which to go without the desired machinery, and if he decides later that it is no longer worth while waiting for a cheaper market he will have just so much longer to wait for his deliveries. There is nothing in the situation to indicate a change from present conditions, and even if the demand were to fall off a bit, which it has not here in New England, there would still be small inclination to change present lists. Nothing has occurred during the week to destroy the full confidence which appears to be felt by every one connected with the machinery trade, and this applies to all kindred lines. Taking cranes as an example, the dealers state orders continue as numerous and as profitable as ever. And so it is through the multitudinous lines which go to make up the general trade.

No Boston dealer has experienced anything but a first rate business in all departments during the past week, and the outlook for a continuance is exceedingly bright, they assert without restriction. The machine tool builders and other manufacturers of machinery and equipment make a similar statement. "Never better" is a familiar answer to the question as to the condition of business based upon current orders and inquiries.

One of the Boston machinery houses had a little experience a few days ago, which illustrates the ease with which machinery can be disposed of. Six 14 in. by 6 ft. engine lathes, with quick change feed and other modern appurtenances, a high class, high priced tool, arrived at the store one morning. No one in the place knew why they came. No record of an order was found, and no one could remember having given any instruction to the manufacturer concerning such a lot of tools. It was finally discovered that a telephone order, placed some time before, of course, had been given, but in the rush of business no order had been booked, neither had the telephone conversation been ratified by letter. Naturally no customer had been told of the possible chance to get these machines. They were kept, however, and sold within a very short time with the assistance of some 20 2-cent stamps. Nothing more than a few letters was required. Under such conditions it is surprising to find any one putting off purchasing because of a feeling that the market may drop.

The Free Exhibit of Industrial Conditions held all last week at Horticultural Hall, Boston, was very largely attended by all classes of people, including many manufactur-

ers and their employees. Factory and shop hygiene and safety devices of all descriptions came in for a large share of attention, the exposition including not only machinery models and other similar exhibits, but a great number of illustrative photographs. Among the speakers was W. A. Viall of the Brown & Sharpe Mfg. Company, who told of the work done in his works in eradicating tuberculosis, which has been described in *The Iron Age*. Among those who contributed to the success of the exhibition were many manufacturers in various classes of metal trades, including the American Locomotive Company, New York; Bullock Electric Mfg. Company, Cincinnati; Cleveland Twist Drill Company, Cleveland; Brown & Sharpe Mfg. Company, Providence; Chandler & Farquhar Company, Boston; Cleveland Cliffs Iron Company, Cleveland; Dennison Mfg. Company, Boston; Gorham Mfg. Company, Providence; General Electric Company, Lynn; International Harvester Company, Chicago; Niagara Falls Power Company, Niagara Falls, N. Y.; Plymouth Cordage Company, Plymouth, Mass.; Solvay Process Company, Syracuse, N. Y.; B. F. Sturtevant Company, Hyde Park, Mass.; Sherwin-Williams Company, Cleveland; United Shoe Machinery Company, Boston; Walker & Pratt Mfg. Company, Boston; Waltham Watch Company, Waltham, Mass.; Westinghouse Air Brake Company, Wilmerding, Pa.; Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.; Connell & Dangler Machine Company, Rochester, N. Y.; Norton Company, Worcester, Mass.; Pfeil & Gurtner, Buffalo, N. Y.; Turner Specialty Company, Boston; Non-Explosive Naphtha Container Company, New York; National Fireproofing Company, Chicago; Northern Specialty Company, Utica, N. Y.; Haines, Jones & Cadbury Company, Philadelphia; Price Fireproofing Company, Poughkeepsie, N. Y.; National Cash Register Company, Dayton, Ohio; Grip Nut Company, Chicago; Portable Electric Safety Light Company, Newark, N. J.; H. & M. Valve Company, New York.

The Heald Machine Company, Worcester, Mass., is to greatly increase its works at Greendale by the erection of an addition, 90 x 150 ft., corresponding to the remainder of the building, which is of very high studded one-story construction, with the exception of the front, which has two stories, the upper of which is devoted to offices and drafting room. The new manufacturing space will about treble the productive capacity of the works, taking into account the portion of room in the present building which is non-productive. The radical enlargement has been made necessary by the rapid increase in demand for the company's grinding machines, a line which has been notably extended of recent years, including several well-known special machines used by many automobile manufacturers and manufacturers of combustion engines generally. Great pains will be taken with the sanitary conveniences for the workmen, including the washroom, where individual washbowls will be installed. The works are now much congested, new machinery having been installed lately, and other machinery has been ordered.

The Traut & Hine Mfg. Company, New Britain, Conn., manufacturer of metal trimmings, sheet metal and wire goods, has started the construction of an addition to its factory, 65 x 105 ft., and five stories, which will be devoted to manufacturing purposes.

The Consolidated Wrapping Machine Company has been organized at Springfield, Mass., to manufacture a line of machinery devoted exclusively to the wrapping of all classes of goods where accurate and attractive work is required. The company already has works at 115-117 West Thirty-first street, New York, but it is the intention to establish shops at Springfield. The company states that it cannot at this time tell what equipment will be required. The capital stock is \$500,000. H. M. Kilborn, New York, is the president; Frank H. Page, Springfield, vice-president and general manager; Henry H. Bowman, Springfield, treasurer. These officers and Henry Heide, New York; H. W. Hoops, New York; Irving H. Page, J. Stevens Arms & Tool Company, Chicopee Falls, Mass.; Robert W. Day, Springfield; Frank Z. Maguire, London, England, and Edwin F. Fobes, Boston, constitute the Board of Directors. The general offices of the company will be in Springfield. It is planned to continue the New York branch, and other works besides that at Springfield will be established.

The Kinkead Mfg. Company, Bay State Building, Lawrence, Mass., has been incorporated in Massachusetts to handle Kinkead's patent device for aligning and leveling shafting. The company does not propose to begin manufacturing for itself immediately. Henry N. Peabody is the president; Napoleon Guilmet, treasurer, and Louis Spiegel, clerk. The device is a new one, but has already been installed in a number of large manufacturing establishments.

D. & H. Scovil, Higganum, Conn., manufacturer of planters' hoes, is to replace its grinding and polishing shops. The grinding shop will be 70 x 90 ft., and the polishing room 40 x 65 ft., both one story and of concrete construction. The improvements contemplate new machinery and some increase in capacity.

The Elliott Company, 100 Purchase street, Boston, manufacturer of the Elliott addressing machine, is contemplating

building a new factory in the near future, but plans are not yet definitely decided.

Frank Wheeler & Son, Meriden, Conn., manufacturers of presses and special hardware, are having plans prepared for a new factory building, 60 x 60 ft.

The American Mason Safety Tread Company, Lowell, Mass., manufacturer of the Mason safety tread, is to erect a new factory at Lowell, 50 x 100 ft. and three stories.

Foreign business continues excellent with those dealers who handle it, and with those manufacturers who are not devoting their entire output to taking care of domestic orders. Some of the machine tool builders are paying nearly the same amount of attention to their foreign trade as they did when business was light in this country, their reason being that customers abroad will constitute a valuable asset when business shall be less satisfactory at home. Other machine tool concerns are giving scant heed to foreign orders. Instances are reported of tools stolen from lots reserved for shipment across the water. To steal in the machinery trade means to take a tool from one order to satisfy another customer, favoring him at the expense of the other. It is not at all an uncommon practice, in a small way, constituting a makeshift to take care of emergencies of business, and is almost inevitable some time or other, though some houses have rigid rules against it. There has been less compunction concerning this treatment of tools ordered for customers in Europe and elsewhere abroad, because of a feeling that domestic orders should have precedence. In other instances foreign business is declined, because of the press of orders from American customers. Certain special types of machines, the outgrowth of long experience, the evolutions of ideas of the highest grade of American designers, should not suffer so much from neglect of foreign markets as the more standard types, in which there is genuine competition abroad, especially from German and English builders. The feeling exists with some manufacturers that even if the foreign market were entirely dropped for a year or two the rapid improvements of American machine tools would make the task of re-entering the field a comparatively easy one. But this is not the general idea. Even machine tool builders who are paying small attention to anything but domestic business express regret that they have been compelled to follow this course, believing that they will be the sufferers later on, while their competitors abroad and those at home who have kept after foreign business with unabated zeal, or at any rate have given it its proper attention, will be the gainers.

The Townsend Mfg. Company, Winchendon, Mass., manufacturer of rivets and staples, is building a new factory, 40 x 100 ft. and one story. The company states that it will buy additional wire forming machinery and rivet and heading machines.

The new building which the F. E. Reed Company, Worcester, is to erect this spring, referred to briefly in *The Iron Age* of last week, will be 83 x 130 ft., three stories and basement. It will occupy land recently purchased for the purpose, adjacent to the shop building on Lamartine street, of which it will be practically an extension, with passageways at each floor. It will be occupied for erecting shop and storerooms, which will permit of the use of considerable space in present buildings for manufacturing purposes.

A brick and concrete building will be constructed at the Charlestown Navy Yard this season, to be devoted to the manufacture of wire rope. The structure will be 40 x 120 ft. and three stories. Machinery for manufacturing rope will be required, but the funds for the purpose will not be available until July 1, so that bids will not be asked for at present. The cost of the building will be \$75,000. The Charlestown Navy Yard will also get a new power plant building, 78 x 120 ft. and two stories, to cost \$25,000.

It is a fact well known in machinery circles that New England has become a very much more important machinery market, relatively speaking, than it was a decade ago. An impression prevails in some other parts of the country that industrial New England has rather gone backward, if anything. Ten years ago the impression was close to the fact. But the period from 1895 to 1905 showed a vast industrial growth compared to that of the previous decade, 1885 to 1895. Some figures which have just been published concerning Massachusetts manufactures prove the fact, and what is true of Massachusetts is at least equally true of Connecticut and probably of Rhode Island. Governor Guild in urging upon the Massachusetts Legislature the establishment of a commission on commerce and industries to consider the finances, manufactures, transportation facilities and general business conditions of the Commonwealth, quotes figures obtained from the State census, which is taken in the intermediate period between the years of the national census. In the 10 years from 1895 to 1905 the value of manufactured products increased from \$734,000,000 to \$1,124,000,000, which is a growth of 53.01 per cent. The item of machinery and metal goods affords an excellent illustration of growing industrial importance, and its corresponding effect on the machinery market. The increase from 1895 to 1905 was 44.47 per cent., which reduced to dollars amounts to \$32,-

\$14,000. The total stood at \$106,550,000 in 1905, as compared to \$73,750,000 in 1895. But most significant of all is the fact that the increase in growth from 1885 to 1895 was only 19.6 per cent., as compared to 44.47 per cent. As has already been stated, the growth has been just as pronounced in the machinery market in the States of Connecticut and Rhode Island, and also in those parts of Maine, New Hampshire and Vermont where metal and metal working machinery is employed in manufacturing.

The Davenport Machine Tool Company, Springfield, Mass., is to remove its business to New Bedford, Mass., where its machinery will be built by the Morse Twist Drill & Machine Company, in a new building now being erected, 40 x 71 ft., two stories. The company was formerly with the Morse Twist Drill & Machine Company and moved to Springfield about two years ago.

Eugene N. Foss, head of the B. F. Sturtevant Company, Hyde Park, Mass., is taking the lead in an important cotton mill enterprise, which plans the erection of mills to cost \$1,000,000 at East Boston, Mass. There will be a great weave shed and a spinning mill, both four stories, with an initial capacity of 50,000 spindles, and a central power station. The plan calls for the expenditure of an additional \$4,000,000 in the future. The buildings will be of reinforced concrete and brick.

The M. D. Vaughn Company, Incorporated, 422 Main street, Melrose, Mass., has been organized to manufacture ventilating apparatus for opening and closing windows in foundries, power plants, electric light stations and all kinds of monitor roofs. Harry C. Woodill is president and Melburn D. Vaughn treasurer. The capital stock is \$3,000.

The Bridgeport Chain Company, Bridgeport, Conn., manufacturer of weldless steel wire chains, is to build an addition to its plant 42 x 140 ft., three stories. The company's business has grown so rapidly that it has become necessary to add this additional space in order to handle it to best advantage.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 16, 1907.

The machine tool business has been very satisfactory during the past week, according to the reports of the local dealers. Orders continue to be booked in a satisfactory volume, and inquiries are as numerous as ever. The buying, as for a number of weeks past, has been general, practically all the orders being for one or two tools for additional shop equipment. Deliveries show no improvement, and dealers report that they could make many more sales if they could make reasonably prompt shipment. Owing to the poor deliveries, there are lots of inquiries for good second hand tools, but they are very scarce. Among the inquiries now in the market is one for about \$25,000 worth of machine tool equipment for a plant that it is proposed to erect in this city for the manufacture of machine tools. The organization of the company has not yet been completed. There is also an inquiry for tools to the amount of about \$25,000 for another company, which is said to be in the process of formation. Local manufacturers of machine tools, cranes, hoists and other machinery report that their volume of business shows no falling off, and that all indications point to good business throughout the entire year. The majority of the plants have orders enough to keep them busy for months ahead, and many of the plants are working night shifts. Some of the manufacturers report that the operations of their plants are interfered with by delay in getting raw material.

The Champion Machine & Forging Company, recently incorporated by a number of Cleveland men, has purchased the plant formerly occupied by the Hussey Drop Forging & Mfg. Company. The new company started its plant a few days ago, and will make steam forgings. Some new equipment, including a Cleveland punch and shear, Bell steam hammer, two lathes, two drill presses, planer and a power cold saw has been installed. The company will soon be in the market for some additional machine tool equipment. L. W. Greve, secretary-treasurer of the Cleveland Pneumatic Tool Company, is president; C. W. Durschlag, vice-president; E. C. Meyer, secretary, and James Jones, treasurer.

The Wellman-Seaver-Morgan Company has recently received an order from the Mammoth Copper Mining Company, Kennett, Col., for an electric incline hoist, capable of lifting a load of 20 tons 5000 ft. up the mountain side. The hoist will be operated with hand brakes with auxiliary air brakes. The company is now booking orders for delivery on June 1, 1908, every department of the plant, with one exception, being filled up with work for a year ahead.

Bids for a large addition to be built to the plant of the Dean Electric Company, Elyria, Ohio, have been received

by the Osborn Engineering Company, and work will be started in a short time. The company will erect a five-story addition, 50 x 300 ft., of reinforced concrete, which will double the capacity of the present plant. A new power plant will also be built. The power equipment will include two 250-hp. Ball engines. The company is purchasing considerable new machine tool equipment.

The Standard Welding Company will let the contract in a few days for the large new plant that it will erect this summer. Bids have already been received on the steel work and the plans and specifications are now in the hands of the contractors. The company will soon be in the market for about \$10,000 worth of machine shop tools and a number of motors of from 10 to 30 hp. The machines in the new plant will be run in groups, all electrically driven, and the total motor requirements will be from 175 to 250 hp.

The Standard Tool Company is in the market for a broaching press, one that will broach a $\frac{3}{4}$ -in. square hole. The company has just placed an order for two Hendey milling machines.

The Standard Sand & Machine Company has commenced the erection of an addition to its factory, which will be used as an erecting room. The building will be 40 x 140 ft., one-story high. The company is in the market for a freight elevator.

Among the machine tools shipped by local dealers during the past few days was an order of \$12,000 for the temporary plant of the Ranier Motor Car Company in Detroit, Mich.

The W. M. Pattison Supply Company has been given the agency for the pattern making machinery manufactured by the Oliver Machine Company, Grand Rapids, Mich., and is now keeping that company's tools in stock.

Announcement is made that the Hocking Valley Railroad will soon begin the erection of new repair shops at Logan, Ohio. It is expected that the company will spend in the neighborhood of \$100,000 in the buildings and equipment.

The Ohio Grease Lubricant Company, manufacturer of grease lubricators, compressor cups and brass specialties, contemplates the erection of a new factory in Canton, Ohio. B. F. Fisher is president, and C. A. Fisher, secretary and treasurer.

The Lake Erie Iron Company is erecting an addition to its power plant. The new building will be a one-story brick and steel structure, 85 x 210 ft.

The Southern branch office of the Cleveland Pneumatic Tool Company is now located at 419 Empire Building, Atlanta, Ga., having been recently moved from its former location in Chattanooga, Tenn. R. P. Decker, who represented the company in Chattanooga, is now acting in a similar capacity in Atlanta. The company is carrying a full line of tools and parts in Atlanta.

Cincinnati Industrial Notes.

CINCINNATI, OHIO, April 16, 1907.

The Union Iron Works Company, Cincinnati, Ohio, with a capital stock of \$150,000, has been incorporated as a result of merging two long established and well-known companies, heretofore known as the Stewart Iron Works Company, Architectural Department, and the Walton Iron Works Company, both of Cincinnati. The new corporation will occupy the premises and buildings now being erected on Colerain avenue, mentioned in this column recently, as soon as completed, and when located therein, the erection of additional buildings will at once be commenced. The consolidation of these two companies will place the new corporation among the largest in its line in the country. The incorporators are R. C. Stewart, W. A. Stewart, J. F. Walton, John Hartman and N. L. Gordon.

A new company has been incorporated with a capital stock of \$100,000, by R. B. Lueble, W. W. Birch, W. F. Decker, S. W. Spear, W. F. Spear and H. Stoffels, for the purpose of engaging in the foundry business. The new company will secure a site in the vicinity of Elmwood place, on the Norfolk & Western Railroad, adjacent to Cincinnati, and will give employment to 150 hands. The company is in the market for foundry equipment and supplies.

The incorporation of the company to operate the blast furnace to be erected at Hamilton, Ohio, was effected on April 11. The company is to be known as the Hamilton Iron & Steel Company, with Geo. L. Pearson of Pittsburgh, president; Edwin L. Ohi, also of Pittsburgh, vice-president and chairman of the Executive Committee; R. E. Field, secretary and treasurer. N. S. Keith, W. R. Todd and F. F. Dismore of Cincinnati, and O. V. Parrish of Hamilton, Ohio, directors. The president has been empowered to issue instructions for the erection of the plant at once.

Incorporation papers have been issued to the Keystone Construction Company, with a capital stock of \$10,000, the incorporators being E. L. Phillip, A. E. Richards, A. D. Alcorn, Logan Cambrow and H. V. Sampson. The company will build and complete the new plant of the Hamilton Iron & Steel Company.

A fire, originating from sparks from the cupola, damaged a portion of the structural iron works department of the Hetherington & Berner Company, Indianapolis, Ind. While the loss was comparatively small, approximately \$5000, it seriously inconvenienced the company in that department, owing to the fact that work was being rushed preparatory to moving the entire establishment into the new plant on Kentucky avenue and McCarty street, which has been in course of erection for some months past, and which in another 30 days will be ready for occupancy.

The William Kavanaugh Company, Norwalk, Ohio, manufacturer of gas engines, oil and gas well supplies, since its removal from Pennsylvania has grown so rapidly as to necessitate the erection of a foundry 60 x 160 ft., for the purpose of producing the castings required for its gas engines and oil well supplies and oil country requirements. The melting capacity of the new foundry will be 12 tons. The first heat was taken off on April 6.

Government Purchases.

WASHINGTON, D. C., April 16, 1907.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until May 4 for boilers and other equipment for the Pensacola Navy Yard.

The following bids were opened April 8, Circular No. 357, for supplies for the Isthmian Canal Commission:

Bidder 13, The Drew Machinery Agency, Manchester, N. H.; 16, Fox Bros. & Co., New York; 22, Knox & Bro., New York; 26, Manhattan Supply Company, New York; 48, Vermilye & Power, New York; 49, V. D. Williams, New York.

Class 15. One portable pressure gauge testing machine—Bidder 16, \$58.50, 30 days; 22, \$54, 15 days; 26, \$74.20, 15 days; 48, \$64.95, 15 days.

Class 21. One combination automatic self feed and lever feed upright drill—Bidder 13, \$52, 20 days; 49, \$35, 15 days.

The following bids were opened April 9 for supplies for the navy yards:

Bidder 1, the American Hoist & Derrick Company, St. Paul, Minn.; 8, Chicago Pneumatic Tool Company, New York; 19, Frevert Machinery Company, New York; 22, A. D. Granger Company, New York; 23, G. & W. Mfg. Company, New York; 35, Lidgerwood Mfg. Company, New York; 40, Lambert Hoisting Engine Company, Newark, N. J.; 42, Manning, Maxwell & Moore, New York; 43, Manhattan Supply Company, New York; 47, Pittsburgh Industrial Iron Works, Pittsburgh, Pa.; 56, Williamson & Bros. Company, Philadelphia, Pa.; 57, Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn.; 63, Drew Machinery Agency, Manchester, N. H.; 69, Motley, Green & Co., New York; 71, Niles-Bement-Pond Company, New York; 74, Vermilye & Power, New York.

Class 41. Two hoisting engines—Bidder 1, \$1901; 22, \$1844; 23, \$1633.70; 35, \$1750; 40, \$1,498.50; 43, \$1799; 47, \$1150, part; 56, \$1827; 63, \$1630 and \$1664; 69, \$1589.70; 74, \$1650.

Class 51. One double action open back press with finger motion and cam actuated knockput, mounted on adjustable inclinable legs—Bidder 57, \$1600.

Class 61. Two valve reseating machines—Bidder 19, \$441; 43, \$450; 52, \$450; 63, \$450; 69, \$450.

Class 62. One No. 4 single punching and shearing machine—Bidder 42, \$1675; 71, \$1900 and \$1575.

Class 63. One portable pneumatic countersinking machine—Bidder 8, \$215.

Class 64. One water tool grinder—Bidder 19, \$358; 42, \$297; 69, \$290; 71, \$323.

Under bids opened April 2 for supplies for the navy yards, the Chicago Pneumatic Tool Company, New York, has been awarded class 73, one rotary drill and three pneumatic drills, \$260; George F. Blake Mfg. Company, New York, class 102, two vertical simplex pumps, \$105.

The following awards have been made for equipment for the power plant for the State, War and Navy Building in Washington, D. C.: Boilers, the Babcock & Wilcox Company, New York, \$12,558; pumps, International Steam Pump Company, New York, \$14,950; heating equipment, Evans, Almirall & Co., New York, \$60,533.

Under bids opened March 19 for machinery for the navy yards, the following awards have been made:

The Brown & Sharpe Mfg. Company, Providence, R. I., class 22, three universal milling machines, \$8376.

The Garvin Machine Company, New York, class 24, five engine lathes, \$2575.

The Becker, Brainard Milling Machine Company, Hyde Park, Mass., class 25, one automatic gear cutting machine, \$650.

The Fairbanks Company, New York, class 26, one iron planer, \$3200.

The Prentiss Tool & Supply Company, New York, class 31, one heavy planer miller, \$1798.

The Oliver Machinery Company, New York, class 34, one type C hand sawing machine, \$290.

Bids were opened at the Bureau of Yards and Docks, Washington, March 30, as follows for 1000-kw. generating set:

The Providence Engineering Works, New York, item 1, \$59,900; 6, \$58,500.

Henry R. Worthington, New York, item 5, \$8656; substituting interior cooler for exterior, \$8469; for single suction pump, \$8386; for 2-in. double pump, \$8722.

The Westinghouse Electric & Mfg. Company, Baltimore, Md., item 1, \$51,995, \$52,182, \$46,774, \$46,395 and \$46,495; 3, \$49,375; 6, \$41,225.

The following bids were opened March 28 for an electric plant at the workhouse, Blackwell's Island:

The Gore Duggan Engineering Company, New York, \$28,307.

The Electric Construction & Supply Company, New York, \$31,000.

William M. Sheehan & Co., New York, \$32,803 or \$36,303.

Albert Winternitz, New York, \$32,000.

The Stevens Hewitt Engineering Company, New York, \$34,000.

The Howe Engineering Company, New York, \$34,895.

The Kinney-Freeman Company, New York, \$35,900.

Charles F. Brown, New York, \$36,000.

Reis & O'Donovan, New York, \$36,478.

The J. Reilly Repair & Supply Company, New York, \$37,205.

The Monaton Construction Company, Brooklyn, N. Y., \$43,435.

The A. D. Granger Company, New York, \$43,800 or \$43,900.

Under Circular No. 352, bids opened March 1, for supplies for the Isthmian Canal Commission, class 1, one tandem compound engine, has been awarded to the Buckeye Engine Company, Pittsburgh, \$3245, and class 2, one pattern makers' lathe, the Oliver Machinery Company, New York, \$77.

The following awards have been made for supplies for the navy yards, bids for which were opened March 26:

The Berger-Carter Company, San Francisco, Cal., class 21, four automatic motor hoists, \$964.

The Hallidie Machinery Company, Seattle, Wash., class 26, one steel pressure blower, \$202.

The Niles-Bement-Pond Company, New York, class 101, one 25-ton electric traveling crane, \$5545.

The Prentiss Tool & Supply Company, New York, class 127, one keyseater, \$634.

The Brooklyn Forge & Supply Company, Brooklyn, N. Y., class 133, two pipe benders, \$554.50.

The following awards have been made for supplies for the navy yards, bids for which were opened March 12:

The Niles-Bement-Pond Company, New York, class 1, one engine lathe, \$5110; class 3, one set bending rolls, \$3400; class 4, one set straightening rolls, \$4675; class 6, two vertical drilling machines, \$1730.

Manning, Maxwell & Moore, New York, class 5, one vertical drill, \$1800; class 8, one rotary slitting shears, \$690.

The Prentiss Tool & Supply Company, New York, class 152, one bench speed lathe, \$42.

The following awards have been made for supplies for the Isthmian Canal Commission, under opening of March 12:

Fox Bros. & Co., New York, class 1, one combined rip and cut-off saw, \$276.98; class 11, one automatic planer knife grinding machine, \$198; class 15, one dimension planer, \$2194.

Manning, Maxwell & Moore, New York, class 2, one combination band rip saw and resaw machine, \$828.14; class 3, one automatic feed rip saw machine, \$532.30.

The Niles-Bement-Pond Company, New York, class 18, three steam hammers, \$5972.

The Bentel & Margedant Company, Hamilton, Ohio, class 4, one automatic railroad cut-off saw, \$418; class 5, one vertical car boring machine, \$800; class 6, one vertical hollow chisel car mortising machine, \$1450.

Greenlee Bros. & Co., Chicago, Ill., class 7, one automatic car gaining machine, \$1407.

The Berlin Machine Works, New York, class 8, one planing, matching and joining machine, \$2425; class 9, one planing, matching and joining machine, \$2285.

The Oliver Machinery Company, New York, class 10, one hand planer and jointer, \$295.

Three of the hot mills in the sheet plant of the Whitaker-Glessner Company at Martin's Ferry, Ohio, started up April 15, and the other three mills will be started in about two weeks. The company intended to start its plant at an earlier date, but was delayed on account of the flood.

Reports that the American Sheet & Tin Plate Company is negotiating to take over the sheet mill plants of the Niles Iron & Sheet Company and the Empire Iron & Steel Company at Niles, Ohio, have been officially denied.

CONTENTS.

	PAGE.
A Water Main Tapping Machine. Illustrated.....	1185
Open Hearth Steel in 1906.....	1186
Electricity at the Jamestown Exposition.....	1186
The Wadsworth Portable Core Oven. Illustrated.....	1187
A Feeding Device for Rolling Mills. Illustrated.....	1188
Mexican Railroad and Business Notes.....	1189
A New Engineering Building at Swarthmore.....	1189
A New Besly Spiral Disk Grinder. Illustrated.....	1190
Railroad Shortcomings in Germany.....	1190
The Pennsylvania's All-Steel Mail Car. Illustrated.....	1191
New National Portable and Stationary Air Compressors. Illustrated.....	1192
San Francisco Trade Topics.....	1193
Phosphorus Additions to Bronze.....	1193
The Rodin-Eckstrom Belt and Roller Sander. Illustrated..	1194
Useful Machine Shop Information.....	1195
The Corrosion of Acid and Basic Steel. Illustrated.....	1196
The New England Foundrymen's Association.....	1197
The Luermann Cinder Notch. Illustrated.....	1198
The Costello Continuous Annealing Sheet Furnace. Illus..	1199
The Cold Twisted Lug Bar. Illustrated.....	1200
Cooling Towers.....	1200
The New Lazler Gas Engine. Illustrated.....	1201
The National Machine Tool Builders' Association.....	1201
A New Bar Mill at Joliet.....	1201
The Lap Joint in Rollers. Illustrated.....	1202
The Denatured Alcohol Regulations Criticised.....	1204
The Turbine Centrifugal Oil Filter. Illustrated.....	1205
An Electrically Driven Paper Mill in Japan.....	1205
The Powell Blow-Gun Air Valve. Illustrated.....	1205
Editorial:	
Open Hearth Steel Soon to Pass Bessemer.....	1206
The Proposed Machinery and Metal Club.....	1206
The Public Free Employment Office.....	1207
The Character of Our Pig Iron Imports.....	1208
The Shop Training of Salesmen.....	1208
The Steel Corporation's Annual Meeting.....	1209
First Report on the Production of Denatured Alcohol....	1209
Naval Gun Forging Bids.....	1209
German Tariff Negotiations Satisfactorily Concluded....	1210
Personal.....	1211
Obituary.....	1211
Steam Turbines for Lake Freighters.....	1211
Steel Production in Great Britain in 1906.....	1212
Labor Notes.....	1212
Trade Publications.....	1213
News of the Works:	
Iron and Steel.....	1214
General Machinery.....	1214
Power Plant Equipment.....	1214
Foundries.....	1215
Bridges and Buildings.....	1215
Motors and Small Engines.....	1215
Fires.....	1215
Hardware.....	1215
Miscellaneous.....	1216
The Engineering Societies Building Dedicated.....	1216
The Iron and Metal Trades:	
A Comparison of Prices.....	1217
Chicago.....	1217
Pittsburgh.....	1219
Philadelphia.....	1221
Cincinnati.....	1222
Cleveland.....	1222
Birmingham.....	1223
The German Iron Market.....	1223
New York.....	1224
Metal Market.....	1224
Iron and Industrial Stocks.....	1225
The British Pig Iron Market.....	1225
Drawback on Aluminum Products.....	1225
Chromite in the Transvaal.....	1225
Advanced Freight Rates.....	1226
Recent Customs Decisions.....	1226
The Machinery Trade:	
New York Machinery Market.....	1227
Chicago Machinery Market.....	1228
Philadelphia Machinery Market.....	1229
New England Machinery Market.....	1230
Cleveland Machinery Market.....	1231
Cincinnati Industrial Notes.....	1232
Government Purchases.....	1232
Hardware:	
Condition of Trade.....	1234
Notes on Prices.....	1237
Brass Manufacturers' Meeting.....	1239
Price-Lists, Circulars, &c.....	1240
Trade Winning Methods. Illustrated.....	1241
Hardware Window Display. Illustrated.....	1242
Requests for Catalogues, &c.....	1243
White, Van Gahn & Co.'s New Quarters.....	1244
J. H. Williams & Co.'s Drop Forging Plant. Illus.....	1244
Export Trade Topics.....	1246
Letters from the Trade.....	1247
Trade Items.....	1247
The Boston Convention.....	1248
Miscellaneous Notes:	
Counting Machines.....	1248
The Prichard-Strong Company's Lamps.....	1248
Phenix Swinging Half Screens.....	1248
Perfect Handle Hammer. Illustrated.....	1248
Heller's Dry Color Bins. Illustrated.....	1248
Coldwell's Lawn Mower Grinder. Illustrated.....	1249
The Tabocotton Hoe. Illustrated.....	1249
Bailey's Rubber Exerciser. Illustrated.....	1249
The Bradley Metal Clasp Ceiling Hook. Illustrated.....	1249
Flexible Door Bumper. Illustrated.....	1249
Duchess Self-Adjusting Skirt Hanger. Illustrated.....	1250
Angle Steel Stool No. 20. Illustrated.....	1250
Aligator Y Wrench. Illustrated.....	1250
Trimount Hand Pump. Illustrated.....	1250
General Service Wrenches in Kits. Illustrated.....	1250
Ajax Flat Toggle and Plumbers' Toggle. Illustrated.....	1251
Current Hardware Prices.....	1252

HARDWARE

A NEW law permitting the use of the ordinary postage stamp in place of the special delivery stamp to secure the same end, which will go into effect next summer, marks a step in the forward direction in bettering the postal facilities of the United States. There has been a good deal of complaint that inability to procure special delivery stamps has resulted in serious inconvenience. It was the protest of commercial travelers, we believe, that started the agitation which has developed into a law. Briefly told, affixing 10 cents in stamps in addition to the regular postage, and plainly marking the letter "Special Delivery," will when the law goes into effect insure its delivery just as if the regulation special delivery stamp were employed.

The innovation will be attended by a set of rules issued by the Post Office Department, which will clearly set forth the duties of the sender of a letter under these conditions. First and most important will be the conspicuous marking of the letter as special delivery. Otherwise the additional stamps will simply serve as unnecessary postage. Postal officials who have given the matter some thought call attention to a danger that will exist in practice unless provision be made, that the post office at which such a letter is mailed shall have some method of plainly designating it as special delivery. The presence of postage stamps for the purpose may be plainly evident at the sending office, but at the destination the chance for overlooking the purpose of the additional postage will be material. This is especially the case with packages, where the regular postage may be on one side and the special delivery postage on another. Even with ordinary letters the presence of half a dozen 2-cent stamps is no unusual sight in a post office, and unless the words "special delivery" are conspicuous they may pass unnoticed, and the letter take the usual course of delivery, with its consequent delay. One suggestion is that every post office be provided with stickers, conspicuously colored and worded, which shall be affixed to the envelope or package before it starts on its journey in a mail-sack. Doubtless some such precaution will be taken to make an excellent system work accurately and efficiently. It is no infrequent occurrence to have difficulty in buying a special delivery stamp. In many places the post office closes early, and no one else keeps this stamp for sale. Traveling men know this condition from experience that has sometimes been expensive, because the letter had to give way to a costly telegram or telephone message.

The special delivery system can be made use of to great advantage in business. There is usually a great saving in time, because special delivery letters are sorted from the rest and sent out to their destinations before other letters are attended to. A little study of conditions in places where one does a good deal of business will teach the time of arrival of early morning trains, or midday trains, which will get a letter into the city in time for delivery well before close of business in the afternoon, so that an answer can be mailed back the same day. Surprising results may be had at much less cost than with telephone, and perhaps more satisfactory, because a letter contains the record of a transaction,

while oftentimes a telephone conversation must be verified by letter before it can be considered final. All in all, this assistance to the public by removing the necessity of procuring a special delivery stamp in order to send a special delivery letter is one that will be appreciated.

Condition of Trade.

Notwithstanding the prevalence in most parts of the country of somewhat unseasonable weather and predictions ventured by some of a probable falling off in the volume of business, the trade of merchants in every section continues active, and jobbers and manufacturers are alike kept busy to their full capacity. While in some of the cities there is less building than a year ago, and here and there enterprises are curtailed or deferred, there is little evidence of hesitation or undue conservatism on the part of the public generally, and the prospects for building and improvements in most sections are regarded as excellent. Certainly at present the character of the trade indicates a continued well being on the part of the consuming classes with whom money is comparatively plentiful and who spend it liberally. The demand is indeed in such volume that many staple goods are hard to get, and many manufacturers are far behind their orders. It is noticeable that there is as a general thing particular difficulty in getting the products of those whose goods have an established reputation, the present condition of things thus emphasizing the value of manufacturers' brands when they have made a place for themselves in the public estimation and therefore in the market. Orders for not a few heavy goods also are slow of execution, and in these lines, especially, the shortage of cars and the difficulty in getting Steel aggravates the situation. Under these conditions, with raw material high, prices naturally are decidedly firm, and anything in the way of weakness is quite exceptional. The large trade is showing a conservative spirit so far as its purchases for the future are concerned, but while covering its wants with liberality is not disposed to buy at all speculatively, and is apparently considering the position of something of a slackening in the pace. The question of the crops is naturally receiving attention, and there will be a little more than the usual solicitude in regard to them.

Chicago.

The first fortnight of the current month, now practically completed, shows a volume of business that if sustained will result in gains over the corresponding period of last year, although it will hardly equal the phenomenal trade of the first two weeks in March. Delay in mill and factory shipments, together with inadequate car service, continues to interfere with the free movement of goods. Practically all factories are to a greater or less extent behind with shipments, and in Iron and Steel and Wire products a shortage of Steel adds to and increases the aggravating delays still experienced. Shovel manufacturers are not in position to make deliveries inside of 90 days, and the pressing demand for Wheelbarrows, incident upon the rush of spring construction work, has overwhelmed the makers with orders. An increased demand for large sizes in Nails is noted and is indicative of greater activity in new building; this is confirmed by the report of building permits issued in Chicago, which

for the month of March shows a gain of 4 per cent. over the same month of 1906. Because of the limited supply of furniture and box cars shipments of Screen Doors have been coming slowly, and jobbers are in daily receipt of letters and telegrams imploring the dispatch of consignments now needed to supply actual demand from consumers. The volume of business transactions in Heavy Hardware shows no diminution. In Wood Stock, Iron and Steel Bars and Sheets, orders can be placed only for far forward deliveries. The supply of round edge Tires of sizes required by the Chicago city ordinance is wholly insufficient to meet the demands of the trade, and warehouse stocks of leading sizes are almost completely exhausted. As a result but a very small percentage of the vehicles will be equipped to conform with the ordinance by May 1, when it becomes effective. Some apprehension is felt over the discouraging reports of crop prospects that are coming in from various parts of the country. Phenomenal snowstorms, accompanied with low temperatures, in the North and Northwest, and drought and bugs in the South and Southwest States, are represented to have caused extensive damage. It is pretty safe, however, to accept such reports with reserve, since they are nearly always liable to be greatly exaggerated.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—As we feared, a warm March is succeeded by a cold April. Reports are being received of damage to fruit and other crops. We also hear rumors of the devastation of wheat caused by the "green bug." (Just as we have become acquainted with the anatomical elevation of the boll weevil, they spring another monster on us under the name of "green bug," and now we have got to study him.)

Somehow we take these pessimistic reports philosophically. The farmer is prone to exaggerate, he hollers "wolf" at the slightest provocation. After an experience of the "ups and downs" of a good many years in business, there is only one calamity that has made any deep impression upon our calloused minds and that is a year when there is a widespread and severe drought. Floods are always local. When we have too much rain, while the bottoms may get the worst of it the uplands generally do well, but when a drought gets in its fine work nothing escapes.

The cold weather the past two weeks has evidently had an adverse effect upon retail trade. As a result, there has been somewhat of an easing up in business. This is not unwelcome. It gives us a chance to catch up and straighten out. We believe this lull in business will be only temporary and as soon as warm, seasonable weather returns there will be an immediate revival in business.

Money is working easier. It is expected lower rates of interest will prevail, at least until the time comes again to move the crops.

Our records show a larger percentage of gain in sales over last year for the first half of April than we showed in March. While April will naturally be a smaller month than March, we expect our percentage of gain for the entire month will be greater than in our record month of March.

Our collection department reports while in some cases it is necessary to do a good deal of pounding, collections, taken upon the whole, are quite satisfactory.

Some of our friends engaged in the game of high finance are shaking their heads. They tell us that the days of prosperity are nearing their close. After taking lunch with them we return to the office determined to cut down our force, to seek places where we can retrench. When, however, we talk to the heads of departments and suggest reducing the force we are confronted with records of an increased business, and some of them even have the nerve to intimate they would like to have the number of men in their departments increased. When we go to the buying department and suggest smaller quantities and greater caution, we are met with a commiserating smile and a list of shorts.

We return to the quiet of our inner sanctum and

wonder which is better—to run our business on rumors from Wall Street or upon the actual facts and figures of our own sales and collections. Which shall we do? Echo answers—Which? We sometimes think the mercantile trade would be far better off if the daily papers cut out their Wall Street reports.

We modestly offer the suggestion to our retail friends that they conduct their business just as we propose to conduct ours, and that is, buy goods to supply the demand just as long as our customers pay their bills and we have money to pay ours, and to give just as little time and attention as possible to the doings of speculators and jobbers in stocks. In other words, let each one of us attend strictly to our own business.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Market conditions are still favorable for a large business. The supply of seasonable goods is undeniably short, and transportation is continuing to drag its slow length along, expensive and exasperating. It would seem as though we would have to have an additional line of railroads going through the less populous parts of the country, or at least circumventing the large cities to make any time worth bragging on. Once get a car into a great shift in the freight yards at the larger transfer points, there is no telling when it will work its way out. It is this which is largely responsible for the shortage of cars, aside from the immense tonnage daily offering.

We have simply got to open up better ways of communication or more of them. We want all the help that our rivers can give us, in addition to the railroads in operation. The trouble here is that we are short of steamboats on the Western rivers, and barges and towboats. The whole equipment of navigation has been allowed to run down until the river facilities are so confessedly poor and inadequate that they are not taken advantage of as freely as they should be and might be were the possibilities of floating freight trains realized.

A parallel might be drawn between this and horse breeding. After the appearance of the automobile the idea prevailed that horses would be at a discount, and consequently the stock farms neglected the breeding of horses and mules, which had been formerly a large factor in the wealth of this State. In so far from declining, the demand for live stock of this kind has increased and prices almost doubled, but it will take several years to revive the interest and rehabilitate the stables and pastures.

Rates for money are still very firm, and consequently the country customer is apt to be a little bit out of the perpendicular as to prompt time of settlement. The so-called "usury laws" in times like this work considerable hardship, inasmuch as the seller is naturally unwilling to lend at 6 per cent. for extension when he is paying from 6 to 7 per cent. himself.

Cleveland.

THE W. BINGHAM COMPANY.—In spite of the cold snap in the last 10 days, which was accompanied by snow and rain, and the sudden checking of the warm spring weather that we had a touch of, the weather conditions do not seem to have affected the general Hardware and manufacturers' supply business very much. Our customers have had a good trade since the first of the year, and their stocks are depleted, and they now realize they must get their orders in early if they expect to have the goods on their shelves to deal out to their customers promptly. Shortage on many lines of goods from the manufacturers still exists, and some are working overtime in order to catch up or keep up with their orders now on hand.

There is an active demand for Nails and Wire. Spring goods of all kinds are going forward now on orders that were entered early for spring shipment. Also new orders are being placed by customers who neglected to buy early, and they request that their orders be shipped at once, indicating that there is immediate demand for many lines of goods that they ought to have ordered some time ago. Jobbers' stocks, however, are in better shape than they have been for some months back, as their buyers have

been persistent in punching up the factories and ordering forward many goods that were bought months ago, and the trade can buy now with the assurance that a very large majority of their orders will be filled promptly.

The labor situation is still very bad. It is difficult to get the right kind or experienced men to do business smoothly. There is a big demand for all kinds of labor, and the great development of the automobile business, which necessitates employing a great number of experienced mechanics, makes it very difficult for the merchants and manufacturers to secure sufficient and satisfactory employees to take care of the large business they are doing at the present time.

Prices are steady and firm for the most part, and collections are quite satisfactory.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business continues to be very satisfactory in all departments. The movement of Nails, Wire, Fencing and Plow goods is still very heavy. There is also a big demand for seasonable lines, such as Refrigerators, Freezers, Water Coolers, Lawn Mowers, &c., and a good many fall orders for Cutlery, Guns and Saddlery Goods are now being placed.

The reports we get from the wheat crop in this part of the country are very encouraging, and the prospects are fine for a good crop. The reports on the cotton crop in the further section of the South indicate that it is doing well, and prospects for summer and fall business seem to be good. Collections are very satisfactory.

New Orleans.

WOODWARD, WIGHT & Co., LIMITED.—The general results of the last week in this section have been a steady business for every one in the Hardware trade. Agricultural Goods have moved freely so far. Financial conditions here are working along easily, and with the prospects we have for our crops and the gradual weakening of the car shortage we should run into the second half of 1907, with business in very good shape. While we are all sorry to see the great reduction in values of stocks from the Wall Street district, yet we must bear in mind there is just as much wheat, corn, cotton, sugar and iron in this country now as there was before, and that further there will be less money this fall tied up in carrying stocks on the Stock Exchange than there was last fall by a very large amount.

There is one great advantage in conditions here in the South, and that is business is more on the old basis of individual ownership than it is in the Northern or Western sections of the country. There are almost no incorporated businesses in the South in the agricultural and merchandising lines which are not owned by the people who actually manage them. This is true also of the majority of the manufacturing lines. In other words, the credits which commercial houses obtain in this section from banks are still almost entirely credits based on the moral responsibility and capacity of the people who own the business and the values that are in that business, and not as in more highly developed industrial centers where credits are based on the money in the business and the capacity of the officers who manage it and who do not themselves own practically all of the business. This has made for a certain steadiness and conservatism in business ventures in the South for the last 15 or 20 years.

The fact that our commercial credits are also comparatively short periods, 60 to 120 days, prevents any great overextension of borrowing. There are practically no merchandising concerns and very few manufacturing concerns in this section with any amount of bonds or long time maturities out against them. As a consequence the borrower has always had before him the necessity of being able to liquidate his loans at some short interval. In flush times this lack of being able to discount the future has prevented us, perhaps, from taking the full advantage that other parts of the country have been able to get out of them. But at the same time it makes for business conservatism.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—All indications point to an excellent demand for goods as the season advances, with prospects for a very large trade during the coming months. A large amount of building is in progress throughout the entire Trans-Missouri territory, consequently labor of all kinds can find ready employment at good wages. The whole situation would seem to indicate that business will continue steadily and uninterruptedly.

With the Western people a good deal depends upon the size and value of the coming season's crops, but it is too early yet to form an opinion on this important feature that would be anything further than guesswork. At the present time all conditions are in excellent shape. If any weak spots are exposed later on they will develop in the East, either by the extraction of more water out of the inflated securities or by a slump in the metal market, which has been so long in the hands of the sellers and been worked by them to a finish. Coming events usually cast their shadows before and the trend of the general market will be closely watched with a great deal of interest.

Portland, Oregon.

FAILING, HAINES & McCALMAN.—Conditions in this territory still continue prosperous, with every promise of improvement. Everything points to good crops this year, especially small fruits. The lumber industry was never in better shape than it is to-day, with high prices and large demand. New railroads are still being built and others are constantly projected to open undeveloped country, which is tributary to Portland. Settlers are coming in if anything in even greater numbers than early in the year, and we are anticipating an even greater increase in the population this year than last. This is very largely due to the Lewis and Clark Fair, as a large proportion of these people first heard of the richness of this country through its means. There is no business in the State which has not done as a whole far better than was ever expected, and now we are looking forward to even more prosperous times.

As a result of the present prosperous conditions of the country we are finding collections uniformly excellent, over one-half of our customers discounting their bills and the remainder meeting them promptly when due.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—April business has been good, orders being fully up to expectations. The season has been somewhat backward, but not too much so. The weather has been dry and surplus moisture, which it was feared might do serious damage in some sections, has been passing off in the regular channels, and it is now probable that no considerable damage will result from high water in the Red River Valley and adjacent territory.

Trouble is experienced in getting goods from some of the factories, but thus far, except in rare cases, this has not become serious. There is a scarcity of cars for outgoing freight, but, as yet, the severe pinch has not come here.

Collections are somewhat spotted, coming in satisfactorily from some sections and very slowly from the territory that was snow blockaded in the winter. It is expected that this will loosen up after seeding and will get into about normal condition. Upon the whole collections may be considered fair and the outlook for the spring and early summer business quite good.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Wholesale trade in our own city continues active, and the volume of business continues large with the retail trade adjacent. The weather during the last 10 days has not been springlike; hence the demand for immediate shipments of spring goods has not been much over the possibilities of factory shipments. Nearby manufacturers report continued great activity in their works, and a continued demand for the earliest possible shipment of goods.

The monetary condition is somewhat improved in the banks located in our city and the surrounding retailers are able to make somewhat improved collections. The brokers' stock excitement, which caused a considerable feeling of uneasiness, has largely quieted down. Excitement of this nature does affect some business men, who may fear bad results from such causes. General appearances now indicate continued activity.

We have recently been asked by some readers of *The Iron Age* if we thought our prosperity depended entirely upon the wheat, corn, oat and cotton crops. While it is natural to refer to these important agricultural outputs we should not overlook the fact that our country has other great advantages. The Agricultural Department some few years ago reported some 400,000,000 chickens, producing each year eggs to the value of about \$200,000,000, and the value of chickens sold during the year not far below the latter figure. The number of dairy cows in the United States the same year was estimated at some 20,000,000, and the total value of products derived about \$500,000,000. The butter manufactured was valued not far from \$100,000,000 and the milk produced went into billions of gallons. It is, therefore, not at all astonishing that the present prosperous conditions exist.

From the surrounding General Hardware trade we hear very few complaints of cutting in prices, nor is this to be wondered at. The sales made by the jobbers naturally do not consist of goods bought 4, 6, 8, 10 or 12 months ago, as all the goods bought then are sold, and goods being shipped now are estimated at present cost and prices. But what all persons in trade should fully realize and practice is that there is a just and honorable way of doing business and not indulge in or advocate the practice of selfish personal motives, which may be of single temporary advantage to themselves, but which may be detrimental to the trade of their own city and State, and perhaps extend through the entire country. They should adopt what is practically the plan of a large association, "A High Standard of Business Methods."

Baltimore.

CARLIN & FULTON.—In spite of the lingering affection of winter for the lap of spring, as shown by the snow of yesterday and the ice of last night, business still continues active; but a few warm days would give a greater impetus to trade, and also possibly result in the resurrection of the peach crop, which again has suffered its perennial death. The influence of weather conditions on all outdoor occupations and upon the general trade cannot be denied, especially throughout the agricultural sections, while bad roads frequently paralyze the business activity of a whole community.

The evolution of present business methods in specializing production works, no doubt, economies in the cost, but results generally in very unsatisfactory deliveries of the manufactured products. Many large factories make but a portion of the completed article and rely on other corporations to supply special parts, with the result that frequently at the most important time, when deliveries should be made on contracts the material is delayed, transportation cannot be had, goods are incomplete, and the trade is, of course, disappointed.

During the present season the manufacturing trade generally complain of the unsatisfactory deliveries of all Steel and Wire products, and one can hardly realize how dependent the trade is upon those immense corporations who have concentrated under one management almost the entire production of raw material on this hemisphere. Not only has the demand for Wire products been immense, with corresponding difficulty in obtaining prompt supply, but it is alleged the scarcity of raw material is no greater than that of transportation; in fact, it is on account of the latter that business conditions have been so unsatisfactory. It is to be hoped that the difficulty experienced by the railroads in providing transportation for the freight offered is not the result of manipulation, even though the truth is a reflection upon the ability of management. Dividends may be and, in fact, are necessary for the investment of capital in any enterprise, but it is business that produces dividends, and it must be

taken care of first. Scarcity of cars, lack of trackage and terminal facilities are more in evidence than any decrease in net earnings, and the actual troubles of the railroads are more conjectural than real.

It was supposed that after the flurry in Wall Street following the developments of high finance as applying to railroads that there would be many cancellations of orders, followed by perhaps a dullness in certain lines of industrial activities; but instead of curtailing their purchases the railroads should increase them and apply their earnings to their betterments to enable them to take care of the business which they cannot handle at present satisfactorily to either themselves or the public.

In regard to the general market for goods, we hear of no reductions in price, but on the contrary the tendencies are toward higher prices, resulting from a continued heavy demand and an extraordinarily strong market for raw materials.

NOTES ON PRICES.

Wire Nails.—The volume of new orders and specifications on contracts being received by the mills precludes the possibility of an early catching up with orders to any great extent. Stocks throughout the country are reported low in the hands of jobbers and merchants, and with the commencement of active building operations the probability is that the difficulty in getting Nails will be greater. Excessive demand, scarcity of steel and kegs and shortage of cars all conspire to aggravate the situation. The market continues very firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

New York.—The local demand has shown some improvement during the week, while stocks in jobbers' hands fail in assortment to promptly supply all demands of customers. Deliveries from mill continue slow. The market is fairly well maintained notwithstanding the presence in the market of Nails contracted for at much lower than present prices. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

Chicago.—There is no appreciable let up in the demand, and the energies of the mills are still severely taxed to satisfy consumers, who are impatiently waiting overdue shipments. Improvement in deliveries is confidently expected within a few weeks. Prices remain unchanged, and quotations are as follows: \$2.15 in car lots to jobbers and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New orders and specifications on contracts are heavy, and while the mills are making as large shipments as car supply will permit they are not catching up on back orders to any extent. In addition to a shortage of cars and the supply of steel, Wire Nail mills are having trouble in getting kegs promptly. Reports are that stocks of Wire Nails, not only at the mills, but all over the country, are very light. Indications point to an enormous volume of business in Wire Nails this year, and there may be serious trouble later on, when the building season is most active, in getting Nails. Prices are very firm, but unchanged. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

Cut Nails.—For some time specifications on contract orders have been received in considerable volume by the mills, and, although new demand is now largely for small lots, and consequently lighter, mills are still behind orders. Shortage of steel and scarcity of cars are hampering mills in getting out a full product and in making prompt shipments. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers,

\$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—In this market business is somewhat light, a condition which jobbers do not regard as particularly important, owing to the fact that shipments from mill are far behind, so that they would not be able to supply a large demand with any degree of promptness. Jobbers' quotations are on the basis of \$2.30 for small lots at store.

Chicago.—New rules, now being enforced by railroads regarding the loading of cars for foreign destination, which include a 50-cent per diem charge for absence of cars on other roads beyond five days, are, it is claimed by local shippers, responsible for aggravating delays. It is, under the circumstances, impracticable to load cars other than those belonging to the road of destination. Demand is unabated, though mills are showing improvement in deliveries. Prices are firm, and quotations are as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

Pittsburgh.—The demand for Nails is lighter than for some time, and is confined mostly to small lots. However, the mills are still behind in shipments, buyers having been specifying very freely on contracts for some time. There is still a scarcity in supply of cars, and also in Steel, and this is operating against the mills in getting out full tonnage and in making shipments. Prices are very firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Similar conditions to those in the Nail market are prominent in the Barb Wire situation. Consequently mills are behind orders and are unable to make as prompt shipments as are desired. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	\$2.15	\$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago.—Orders are still being received from Southern points in larger volume than is usual at this season, when fence building is usually abandoned for the work of plowing and planting. From all sections the demand continues good. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, Bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The books of the mills are crowded with orders, and they are unable to make shipments anything like as fast as desired by customers. The scarcity of Steel, and also in supply of cars, is keenly felt, preventing the mills from getting out maximum output and making prompt shipments. The market is very firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	\$2.15	\$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Smooth Fence Wire.—Requirements of factories using Wire and of Fence manufacturers are very large, and mills are still far behind in shipments. There appears to be no immediate prospect of improvement in the supply of cars and of steel. Quotations are as follows, f.o.b. Pittsburgh, 6 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base,	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago.—All shops and factories using Wire are extremely busy and are insisting upon early delivery of needed stock. The demand shows no signs of weakening. Quotations are as follows: In car lots, to jobbers, \$2, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—The demand from Fence makers for Smooth Wire is unusually heavy, and the mills are very much behind in shipments. The scarcity of cars and in supply of steel is not likely to be relieved for some time. The market is very firm, but there are no intimations of an early advance in prices. We continue to quote f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Sheet Metal Ware.—A series of meetings is being held this week in New York which are participated in by leading manufacturers of all lines of Sheet Metal Ware, including Tinware, Enameled Ware, Galvanized Ware, &c. It is understood that the gathering is in the nature of a conference looking toward increased good feeling among the manufacturers and an improvement in general trade conditions, without particular reference to actual market prices. Some events of a social nature have been arranged for, terminating in a formal dinner at the Waldorf-Astoria.

Leather Belting.—An exceptional volume of business has characterized the market for Leather Belting for many months, and many manufacturers have been running considerably behind their orders, especially on the better grades of Belting, which are more and more demanded by the supply trade and large consumers. Hardware jobbers are still handling a great deal of low grade product, which is often made to price by the manufacturers. Some houses, however, are taking on improved lines and are developing an increased business. Although there has been some recession in hides, quotations still remain near their highest level, but it is not improbable that the decline in raw material may go somewhat further and be reflected in prices of finished products. This is especially likely as the market is marked by the keenest competition on the part of manufacturers making competitive goods.

Furniture Nails.—A change in prices has been announced by a number of manufacturers of Furniture Nails, some times referred to as Gilt Nails. The genuine Brass line has been advanced about 10 per cent., and is now quoted to average buyers at 40 per cent. discount. On Plated Nails, however, the price has been reduced 5 per cent., making them quotable on a similar basis at 50 per cent. off.

Bit Braces.—John H. Graham & Co., 113 Chambers street, New York, agents of Mason & Parker, Winchester, Mass., announce an advance in their line of Bit Braces approximating 10 per cent.

Bright Wire Goods.—Manufacturers of Bright Wire Goods and their agents state that there is some falling off in the demand which is now referred to as rather light. Buyers apparently are not disposed to anticipate their requirements. It is asserted, however, that producers are still busy and there is little disposition to make concessions in price, although comparatively small buyers are finding it possible to get pretty close to the manufacturers' bottom prices. Quotations of 90 and 10 per cent. discount on Steel Wire Goods, and 85 and 25 per cent. on Brass Wire Goods may still be given to represent the market in a general way.

Sandpaper.—As stated in these columns a week ago the market for Sandpaper has recently shown some irregularity, owing to reductions by certain of the associated manufacturers, for the purpose of meeting independent competition. It is now reported that such concessions as were made on this account have been withdrawn. The market for the brands of the associated manufacturers may be represented by discounts on Flint and Emery Paper and Cloth of 50 and 10 per cent. On

other brands concessions of from 10 to 10 and 5 per cent. are obtainable.

Builders' Hardware.—Manufacturers of Builders' Hardware state that while the volume of business is not as large as a year ago there is still a heavy demand for all lines and grades, especially from the Central and Western States. Some assert that they have been in no way affected by the cutting of prices referred to last week in these columns, although it is admitted that smaller concerns manufacturing more or less incomplete lines are becoming increasingly prominent in the market. Competitive goods, such as Sash Fasts, Cupboard Catches and Turns, Push Plates and cheap Locks are selling at low prices as compared with better grades. The Eastern market is marked by aggressive competition for desirable contracts.

Bolts and Nuts.—The monthly meeting of the associated manufacturers of Bolts and Nuts is now in session in this city and representatives of the different houses state that market conditions are highly satisfactory. The demand for goods continues heavy and nearly all leading works are considerably behind in their orders. It is given out that existing price schedules and also the terms of 1 per cent., 30 days, recently established, are reaffirmed.

Paris Green.—Under date of April 11 manufacturers announced prices for Paris Green on the basis of 25 cents per pound in Arsenic kegs, on 5 tons and over, this price being subject to change without notice. On April 15 the base price was advanced 1 cent per pound. The announcement of prices in 1906 was made by manufacturers on April 16, and the base price was then 20 cents per pound. The advance between the opening prices this year and those of last year is explained by the scarcity and higher price of Arsenic and the high price of Vitriol. The world's supply of Arsenic is reported as not being equal to the demand, and the high price of Vitriol is the result of high prices for copper. Some manufacturers had sold up their prospective output of Paris Green for this year before prices were announced, to be billed at ruling prices. It is understood that very little Green was carried over by merchants last year, and that demand this spring has been brisk. Present quotations are as follows, subject to change without notice, on the basis of 5 tons and over:

Arsenic Kegs.....	26 c.
Kegs, 100 to 175 pounds.....	26½c.
Kits, 14, 28 and 56 pounds.....	27¼c.
Paper Boxes, 2 to 5 pounds.....	27½c.
Paper Boxes, 1 pound.....	28 c.
Paper Boxes, ½ pound.....	29 c.
Paper Boxes, ¼ pound.....	30 c.

Terms, 30 days, net, f.o.b. New York; Chicago delivery, ½ cent per pound advance.

The following extras are charged for smaller quantities:

5,000 to 10,000 pounds.....	¼c.
1,000 to 5,000 pounds.....	1c.
500 to 1,000 pounds.....	1½ to 2½c.
Less than 500 pounds.....	3 to 3½c.

The majority of manufacturers are charging 2½ and 3½ cents advance, respectively, on the last two quantities.

Rope.—The demand is good, but could be better without exceeding manufacturers' capacity. There appears to be a desire on the part of makers to sell Manila Rope, of which there are so many grades that it is not difficult to satisfy buyers as to price. Cotton and Jute goods are hard to obtain promptly, while in Manila and Sisal there is plenty to supply all requirements. While there is no change in card prices, the market is somewhat affected by the weakening Hemp market and active competition among Rope manufacturers. The following quotations are sometimes shaded ¼ to ½ cent per pound: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¼ to 8 cents; No. 1 Jute ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—As the result of a recent meeting it is reported that there is little probability of independent Glass factories being closed for the season on April 20, the date set by the National Brokerage Company for its

factories to go out of blast. Should this be the final result of the numerous conferences between workmen and manufacturers, it will tend to keep the market in an unsettled condition regarding prices. Jobbers' quotations from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount on all sizes, single and double strength; outside of Greater New York, 90 and 5 per cent. for single, and 90 and 10 per cent. discount for double strength Glass.

Linseed Oil.—The local market continues dull, buying being confined to small lots in most instances. Large buyers, as a rule, have their requirements covered for some time by contract orders. While there is no change in the card prices of crushers, offers ranging from 41 to 39 cents for Out of Town Raw have been made to secure business. New York quotations for jobbing lots are as follows, according to quality: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—Receipts being somewhat heavier at Savannah and demand only moderate here, the market has eased off 1½ cents during the week. It is reported that sales covering May-August deliveries have been made at Savannah at 66 to 67 cents. New York quotations are as follows, according to quantity: Oil Barrels, 71½ to 72 cents; Machine Made Barrels, 72 to 72½ cents per gallon.

BRASS MANUFACTURERS' MEETING.

THE National Association of Brass Manufacturers held what is referred to as one of the most successful meetings in its history, at the Hollenden Hotel, Cleveland, Ohio, on Monday and Tuesday, 8th and 9th inst. Nearly the entire membership was present. A Committee on Tubular Goods was appointed, consisting of H. J. Guerink, Cleveland; A. C. Cogswell, Detroit, Mich.; E. F. Niedecken, Milwaukee, Wis., to report at the next meeting of the association. A delegation from the Detroit Brass Manufacturers' Association was sent to the meeting to secure the co-operation of the National Association in bringing about some reforms in the trade. The delegates were given a hearing and a committee appointed to co-operate with them. F. K. Dibley of Milwaukee is chairman of this committee. Several new members were added to the roll. The next meeting will be held June 25 and 26, at the Hotel Touraine, Boston, Mass.

A. J. BARNES, 21 State street, New York, will about May 1 move his office to the new West Street Building, West and Cedar streets, just erected. Mr. Barnes exports all kinds of Hardware to foreign markets, especially Australia, New Zealand, South Africa and South America. He was for many years New York manager for Whitman & Barnes Mfg. Company, making several trips around the world for that concern introducing its goods, each trip requiring about two years' time.

E. C. ANGELL has resigned his position as general superintendent of the Jones Speedometer Company to accept the general management of the Winchester Speedometer Company, Incorporated, 1557 Broadway, New York, in which corporation he has a large interest as a stockholder. Mr. Angell, in view of his large and practical experience, is regarded as well qualified to direct the affairs of the company.

THE TUTHILL SPRING COMPANY, Chicago, Ill., has issued a call for a meeting of its stockholders to vote on the question of increasing the capital stock from \$50,000 to \$100,000. The large increase in the company's business has rendered this action necessary, more capital being required to carry it on satisfactorily.

ALEXANDER F. REID & SONS, 149 Duane street, New York, will about May 1 remove to 137 Duane street. The house deals in Twines, Sash Cord, Hammocks, Rope, Wick and kindred goods.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

J. S. ROWELL MFG. COMPANY, Beaver Dam, Wis.: Illustrated catalogue of Tiger Seeders, Drills, Disk Drills and Shoe Drills, and Rowell Cultivators, Hay Rakes and Fanning Mills.

AJAX LINE MATERIAL COMPANY, Chicago: Catalogue No. 1, with discount sheet, referring to a large line of Electric Light Specialties, including Pulleys, Insulators, Pole Tops, Brackets, Toggle Bolts, &c.

INDIANA STEEL & WIRE COMPANY, Muncie, Ind.: Booklet referring to its Telephone Wire, with reproductions of numerous letters from unprejudiced experts giving results of tests.

ACORN BRASS MFG. COMPANY, Chicago: Illustrated circular and price-list of Acorn Ventilators.

CRAIN PUMP & LUMBER COMPANY, Philadelphia: Catalogue No. 4, with price-lists on Philadelphia Buckeye Wood Pumps, Chain and Pitcher Spout Pumps, Door Hangers and Ladders.

STANDARD STAMPING COMPANY, Marysville, Ohio: Booklet illustrating and describing Armstrong Door and Window Screens.

COLUMBIAN HARDWARE COMPANY, Cleveland: Circular referring to Gem Anti-Rust Hooks, with booklet entitled "Space Saving Schemes."

WM. N. BROCKWAY ESTATE, Homer, N. Y.: Handsome illustrated catalogue of Carriages, with supplement showing additions to the line.

J. I. CASE THRESHING MACHINE COMPANY, Racine, Wis.: "Case Courier for 1907," referring to Traction, Portable and Skid Engines, Horse Powers, Separators, &c.

ATLAS MFG. COMPANY, New Haven, Conn.: Illustrated pamphlet relating to Shelf Brackets, Coat and Hat Hooks and Tinned Spoons.

HENDEE MFG. COMPANY, Springfield, Mass.: Illustrated catalogue of Indian Motor Cycles, together with price-list of parts.

CHARLES PARKER COMPANY, Meriden, Conn.: Illustrated catalogue No. 17, referring to the company's elaborate line of high grade Bathroom and Lavatory Furnishings.

GRIFFITH & TURNER COMPANY, Baltimore, Md.: Illustrated catalogue No. 20, referring to an extensive line of Farm and Garden Supplies, including Seeds, Tools, Machines, Wagons, &c.

GEO. W. DIENER MFG. COMPANY, Chicago: Catalogues No. 4, referring to Sheet Metal and Hardware Specialties, and No. 6, referring to Forged Tools.

DIAMOND SAW & STAMPING WORKS, Buffalo, N. Y.: Large mailing card referring to Sterling Power Hack Saws.

AYER MFG. COMPANY, Keokuk, Iowa: Advance catalogue for 1907, referring to Perfection Specialties, including Disk Sharpeners, Stock Watering Fountains, Polishing and Buffing Lathes, Foot Wheels, &c.

ANGLE STEEL SLED COMPANY, Kalamazoo, Mich.: Catalogue No. 6, illustrating Children's Sleighs, Coasting Sleds and Bobs, Combination Sled Wagons, Merry-Go-Round Teeters and Steel Specialties.

STEEL BASKET COMPANY, Cedar Rapids, Iowa: Illustrated catalogue of Corrugated Galvanized Steel Receptacles, &c., including Waste Receptacles for Parks and Cemeteries, Coal Baskets, Hoisting Buckets, Scoops, Chutes and Car Movers.

A. L. ADAMS, Cedar Rapids, Iowa: Illustrated circulars referring to Adjustable and Folding Camp and Lawn Furniture and Adams Anvil, Vise and Drill.

T. R. ALMOND MFG. COMPANY, 83 and 85 Washington street, Brooklyn, N. Y.: Unique folder announcing the

approach of the company's salesman in quest of orders for the Almond Drill Chuck, which has been on the market for many years.

THE ACORN BUGGY COMPANY, Cincinnati, Ohio: Illustrated catalogue of Buggies, Stanhopes, Runabouts, Bike Wagons, Surreys, &c.

GREAT WESTERN FURNITURE WORKS, 195-199 Fifth avenue, Chicago, Ill.: Catalogue devoted to Brass and Nickel Display Fixtures, Papier Mache and Wire Clothing Forms, Papier Mache and Wax Heads for showing furnishings, clothing, dry goods, shoes, millinery, cloaks, crockery, &c.

WILLIAM SHAKESPEARE, JR., COMPANY, Kalamazoo, Mich.: Handsome illustrated catalogue for 1907, containing more than 100 pages, relating to fine Fishing Tackle, including Reels, Rods, Baits, Flies, Lines, Hooks, Swivels, Floats, Guides, Tops, &c.

THE REPUBLIC METALWARE COMPANY, Buffalo, N. Y.: Printed matter relating to magazine advertising, which is designed to create a large demand upon the merchant for Savoy Roasters; also Notable Kitchen Specialties and Ideal Tinware, manufactured by the company.

WOODS-SHERWOOD COMPANY, Lowell, Mass.: Illustrated catalogue and price-list with accompanying discount sheet on Sherwood's Standard White Lustral Wire Ware.

WESTERN CLOCK MFG. COMPANY, La Salle, Ill.: Handsome catalogue illustrating and listing an elaborate line of plain and fancy Metal Clocks.

THE METALLIC CAP MFG. COMPANY, 261 Broadway, New York: Price-list No. 20, relating to Quintuple Gold Medal, Silver Medal and Champion brands of extra strength Blasting Caps.

THE WHELOCK FENCE DEPARTMENT of the Wright Wire Company, Worcester, Mass., has issued a circular devoted to the subject of Galvanized Wire Fencing, entitled, "Wire Fence Galvanized After Weaving, vs., Galvanized Wire Fence." The circular constitutes an argument in favor of the former method, which is employed in the manufacture of the Wheelock Fence.

AMONG recent incorporations is that of the Praeger Hardware Company, San Antonio, Texas, capitalized at \$50,000, to do a general wholesale Hardware business. Special attention will be given to Blacksmiths' Supplies and Builders' Hardware. The officers are E. Praeger, president and manager; E. H. Dittmar, secretary and treasurer.

At a meeting of directors of the Penn Shovel Mfg. Company, held at Warren, Ohio, last week, Arthur Walton, president, and George Fordyce, vice-president, resigned. Clay Hanna was appointed vice-president and general manager to succeed Mr. Fordyce, but no successor to Mr. Walton as president has yet been named.

THE GOULD COMPANY, Chicago, manufacturer of Pumps and Well Supplies, formerly located at 22-24 North Canal street, has moved to Ohio and Franklin streets, where the company now occupies a new building, six stories and basement. It is excellently equipped for the company's purposes.

JOHN H. MORRIS, for nearly half a century a leading business man of Youngstown, Ohio, died March 31. He was president and general manager of the Morris Hardware Company for 23 years up to the time of his retirement a little over a year ago.

THE AMERICAN EQUIPMENT COMPANY, Norristown, Pa., manufacturer of Bolts, &c., has appointed F. O. Fayerweather metropolitan representative, with office at 45 Broadway, New York.

THE ALBERENE STONE COMPANY, quarrier and finisher of Sanitary Stone, has removed to new quarters at 223 East Twenty-third street, New York.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

THE BASSETT STORE'S SPRING BOOKLET.

THE JOHN E. BASSETT & CO., New Haven, Conn., have issued a dainty booklet in which occasion is taken of the advent of spring to call attention in a light and attractive vein to seasonable goods. The booklet is entitled "Spring Pen Pictures from the John E. Bassett & Co.," and several of the pages are reproduced herewith, somewhat reduced in size, the actual dimensions being about 3½ x 6½ in. The drawings, of which each page presents two, were specially prepared for the booklet. The pages reproduced relate, it will be observed, to "The Fisherman," "The Lawn Sprinkler" and "The Kitchen."



The Fisherman

A LITTLE lake stretching between green hills
Rugged mountains marking the distant sky line.

The boat rises and falls to the chunk-chunk of the rippling water.
The men cast their flies silently, steadily, motionously.

Skillfully skimming the surface.
A strike! The fish leaps from the water.
Then darts away, the reel whirling rapidly.
The man's alert, the reel clicks, the line tightens.
As the fish swerves to and fro with frantic energy.

The line shortens. Slowly the fish comes nearer.
Leaping and lashing in wild efforts to disgorge the hook.

A scoop of the net, a mass of shimmering silver:
"Gee, that's a beauty!"

Fishing Tackle that catches the fish.
Particular gear for particular fishermen.
In great variety at
The John E. Bassett & Company's.



The Lawn Sprinkler

A BIT of yellow lawn under a scorching sun.
The Man with a hose throwing water to the thirsty grass,
Drooping flowers withering in the sunshine.

All at once the spray stops;
As the Man turns his face
A leak deluges him from behind;
He removes his face and gasps,
"The dam thing's bust!"
The Neighbor calls to him from his window.
Smiles of fiendish glee o'erspread his countenance.
"Why didn't you get good hose?" he says,
"Why didn't you go to Bassett's?"
The Man shakes the water from his ears
But does not answer.

A bit of yellow lawn under a scorching sun.
Drooping flowers withering in the sunshine.

Rubber hose of warranted quality in fifty-foot lengths with nickel sprinkler:
Waterade is good, costing \$5.00,
J. E. B. Special is better at \$6.00,
Double Diamond's very fine at \$9.00.



The Kitchen

SPRING'S bracing and balmy breezes
bringing healthy hunger.
Which naught can satisfy but fulsome food.
A clatter of spoons and dishes.
The whirr of the egg beater.
The savory smell of cooking:
Something's a-doing in the kitchen.

The Housemaid sings soft and soothing
snatches
As she moves methodically about her work.
Useful utensils hang in neat array about her,
Kitchen knock-knacks keep them silent
company.
Moulds and mixers, casseroles and canisters
Broilers and beaters, toasters and timbale
irons
Complete the culinary combination.

Pots and kettles, kettles and pans,
Labor saving kitchen goods and
householdware
From The John E. Bassett & Company
Keep cooks and keep them happy.



Several Pages from "Spring Pen Pictures" Booklet Issued by the John E. Bassett & Co.

The other pages of the little volume are entitled "The Coming of Spring," which is a sort of introductory to what follows "The Garden," "The Hen and the Flower Beds," "The Lawn Mower," "The Ice Man," "The Drink Mixer," "That Pesky Fly," "The Ice Cream Maker," the closing chapter being entitled "A Nocturne," in which Hammocks and Croquet Sets are pleasantly and effectively submitted to the reader. The booklet is an exceedingly creditable one, and with its apt and felicitous style was doubtless appreciated by those who received it. The Bassett store, while dating back to the eighteenth century, is a very live, right up to date establishment, and its publicity methods are well calculated to promote and extend its already large and prosperous business.

ADVERTISING CUTS FOR HARDWAREMEN.

THE J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., has prepared a varied and attractive assortment of mortised half-tone electrotypes, featuring hunting scenes, which will be furnished to Hardware and Sporting Goods merchants on application. The cuts are either half page or full page, magazine size, and are especially adapted for use in connection with circulars, booklets, &c., gotten out by the merchant. It is pointed out that up to date and progressive merchants can easily obtain, with a little well directed effort, considerable ad-

ditional business by circularizing the local sportsmen. The half-tone cuts will be sent free of charge, providing the merchant bears the express charges, which are usually moderate. For newspaper advertising especially the company has prepared a striking series of six 4-in. single column mortised cuts, which will also be furnished gratuitously. The company's advertising department is ready to furnish effective copy for local advertising to merchants handling Stevens Arms who have neither the time or inclination to prepare advertisements.

O. L. MILLER, Hardware merchant, Ravenna, Neb., makes a practice of sending out once a month in circular form reprints of his advertising in the local weekly. The expense of the composition is thus saved, the price charged being for the paper and printing. Mr. Miller has favored us with a budget of these circulars, which are of different sizes and colors, and well illustrated. About 500 each of the circulars are mailed, being sent to parties who are not subscribers to the paper in which the advertisements appeared. In this way he succeeds

in keeping himself and his business in the minds of the people in the territory from which his business is drawn.

THE spring opening of McNutt & Musgrave Bros., Hutsonville, Ill., which was held on March 30 and April 1 and 2, was, we are advised, attended with very satisfactory results, and the firm was well pleased with the success of its efforts to interest and entertain the public. A feature was made of demonstrations. Shafting was put up in the large storeroom and connected with a gasoline engine, and the following machines were shown in operation: Binder and Mower, Corn Planter, Feed Grinder, Corn Sheller, Lawn Mower, Sewing Machine, Washing Machine, Grindstone, Ice Cream Freezer and Pump. Demonstrations were also given of the workings of a Manure Spreader, Wind Mill, Paints, Wagons, Buggies and various implements. Representatives of the manufacturers of the different lines were in attendance and did their share in explaining to the multitude of visitors the special features and construction of appliances and machines.

AN effective business card is issued by the Jones Hardware Company, Richmond, Ind. It is 4 x 3¼ in. in dimensions, and on its face presents an exterior view of the company's large main building. In the space around the picture the fact is noted that the business was established in 1884 and incorporated 10 years later, as

well as the following particulars showing the extent of the company's establishment: Main building, five floors, 78½ x 115 ft.; warehouse in rear, five floors, 60 x 122 ft.; storage sheds, 6000 sq. ft. of floor space. The back of the card describes the company's business as dealing in general trades supplies, embracing machinists', blacksmiths', plumbers', carpenters', farmers', electricians', painters', carriage makers', house builders', public contractors', steam fitters', millwrights', tanners' and roofers', Iron and Steel.

Hardware Window Display

SECOND ARTICLE.

IN the first article of this series attention was called to the increasing attention devoted by Hardwaremen to their show windows. It was suggested that good window displays afford the most practical and economical form of advertising a retail business, giving the largest comparative circulation and yielding the most immediate and tangible results.

A Few Rules

may be given, which must be followed in window dressing, whatever goods are used and however they are ar-

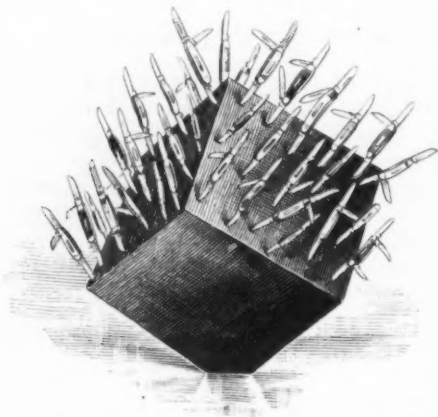


Fig. 2.—Pocket Knives Displayed on Cube with Cork Surface Covered with Dark Plush.

ranged. Many of these principles are obvious, and may be passed with the briefest reference.

Windows Must Be Clean.—It is of manifest importance that windows should be cleaned inside and out, not

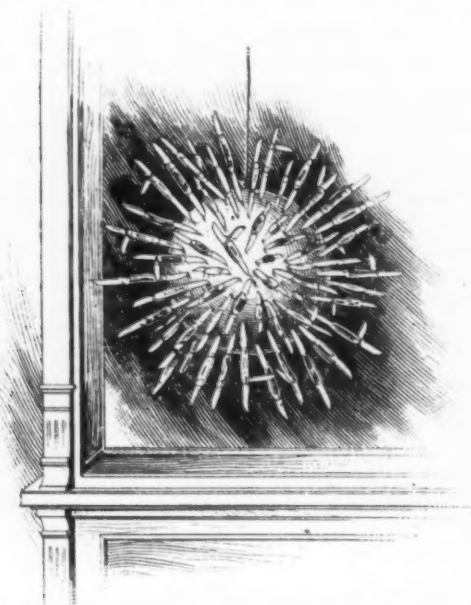


Fig. 3.—A Suspended Ball of Pocket Knives.

only the glass, but shelving, woodwork, &c. Paint and Varnish must be freely used, so that the general effect will be fresh and attractive.

Stock Displayed Must Be Clean.—Only clean, bright goods should go in the window, and they should be kept clean by daily attention.

Inclosed Windows Are Desirable.—If the window has high wainscoting behind it, or, better still, if it is entirely inclosed in the rear, shutting out the dust of the store, it will be found a great advantage. Glass, wood-

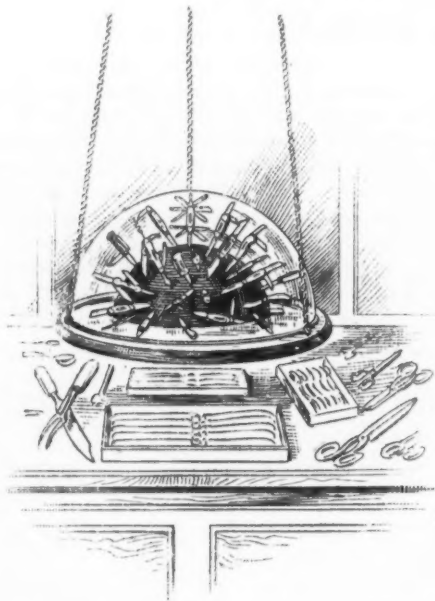


Fig. 4.—Glass Covered Pocket Knife Display.

work and goods displayed can thus be kept clean with much less trouble.

Glass Must Be Kept Free From Frost.—In winter it is absolutely essential that the glass in the show window be kept free from frost. If a window is inclosed in the rear, as already recommended, little trouble will be experienced, since the air inside the glass will not be much warmer than that outside. Otherwise, the frost can be

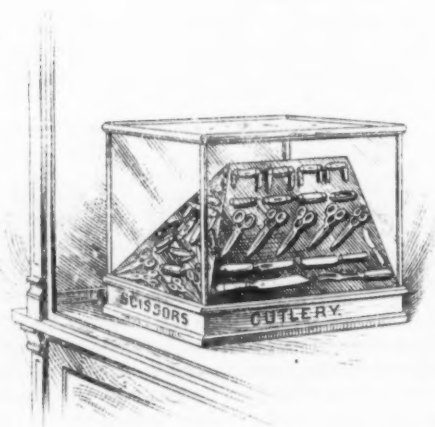


Fig. 5.—Home Made Cutlery Case.

prevented by the use of air currents induced by ventilators or fans.

Windows Must Be Changed Frequently.—Frequent changes in displays are necessary for best results. If the window remains the same week after week people will soon become familiar with it, and will not give it even casual attention. On the other hand, if it frequently contains something new and interesting they will have a tendency to watch it and take considerable interest in the changes which it exhibits. People with whom a merchant is acquainted or unacquainted, customers or those who regularly buy elsewhere, people who do not read the papers and who cannot be reached by any other form of publicity, all these may be attracted by well dressed, up to date, suggestive windows.

Pocket Cutlery Displays.

Pocket Cutlery is a line especially adapted to window display with profitable results, as the goods are handsome and attractive to almost any one. Many men will carry a Knife long after its time of usefulness is past merely because they do not think of getting a new one at a convenient time. The object of Cutlery displays is to present the idea when it is an easy matter to execute it. A unique and striking method of displaying Pocket Cutlery is indicated in Fig. 2, illustrating an assortment of

Knives stuck in a cube about 12 in. square. **Making Cube.** Possibly there will be a small box lying around which will serve the purpose, or a piece of the proper shape can be cut off the end of a good sized stick of timber. Whatever is used the outside surface is covered with sheet cork, which can usually be purchased from a druggist or a druggists' supply house. No particular pains need be taken in tacking on the cork, since it in turn is covered with plush or velvet—cloth will do—of a rich dark shade—black, green or blue. This should be put on with care, making a smooth, plain surface, with straight, square corners. It may be glued or fastened with small tacks that will not show or with brass upholsterers' tacks arranged in orderly rows.

The device is now ready to receive the Knives to be displayed, which should have all their blades or attachments open, so as to show what they contain. The points of the blades can be stuck through the covering into the cork, which will easily hold them in any desired position. Some Knives can be supported by blades extending straight out from the handles, others by half open blades, adding variety to the display. The general result, however, is that the whole cube bristles

with shining blades, which, with the assorted handles, are well set off by the rich dark background. Scissors and Shears stuck in by their points may be similarly displayed. One way to make the device is to cut off a couple of inches or so from one corner of the cube, affording a flat base on which it will set when placed in the window. It may also be hung in the center of the window or any other prominent place by a wire attached to one of the corners.

Fig 3 represents a similar device made in the form of a ball, 8 to 12 in. in diameter, which of course must necessarily be suspended by a wire or cord. It may be covered with dark stuff like the cube or with tricolored material, or may be painted or bronzed. The center of the ball may be made of solid cork, or a cork surface may be put on over a round core of any convenient substance.

A half ball formed as just described, resting on a round platform and covered with a glass globe, Fig. 4, affords another excellent means of exposing the finer grades of Pocket Knives, keeping them free from dust or handling. The platform may be set in the window or hung by wire or small chain, as shown in the cut.

Various forms of Cutlery showcases may be had, excellent ones being easily made in the store by any one who is handy with tools. Fig. 5 illustrates a showcase designed to stand in the window, having

inside the glass a pyramid built up and covered with black velvet or some other rich, dark material on which samples of Pocket Cutlery, Carvers, Scissors, &c., are displayed to advantage. The articles can be conveniently attached with fine wire.

(To be continued.)

McCLELLAN HARTLEY died of pneumonia and heart failure on the 21st ult., at Quaker City, Ohio. Mr. Hartley was the junior member of the wholesale and retail Hardware firm of W. H. Hartley & Sons of Quaker City, with branch store at Cambridge, Ohio. He was a careful, conscientious, thorough, clear-minded business man, and to his executive ability much of the success of the firm is due. Possessing many admirable qualities he was exceedingly popular and was held in the highest esteem by the entire community. During the funeral business in the city was practically suspended

while many hundreds of people followed the remains to the burying ground. Mr. Hartley was a member of the Quaker City Methodist Episcopal Church and was very active in its work. He is survived by a widow, a son and a daughter.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM NIXA MERCANTILE COMPANY, Nixa, Mo., which has bought out the Hardware stores of Keltner & Fox Hardware Company and F. M. Wasson.

FROM BURROW & LINDER, who have acquired the Hardware, Stove, Paint, Furniture and Sporting Goods business of T. F. Meagher, Sprague, Wash.

FROM ROSS & HAMLIN, Wauseon, Ohio, who have lately opened up in Hardware, Stoves, Paints, Silver Plated Ware, &c.

FROM H. B. BLYE & Co., Woburn, Mass., who have lately embarked in the Hardware, Cutlery, House Furnishing Goods and Painters' Supply business.

FROM GEORGE H. MAYER, Du Quoin, Ill., who has lately added a line of Furniture to his Hardware, Stove and Tinware business.

FROM JOHN A. EINFALT, Gretna, Neb., who has bought the Shelf Hardware, Stove, Paint and Sporting Goods business of Sanborn Bros.

FROM CHAS. S. LAWRENCE, formerly with W. B. Fox & Bro., who has just embarked in the Hardware purchasing business, with office at 40 Dearborn street, Chicago, Ill.

FROM DRESSLAR HARDWARE COMPANY, Los Angeles, Cal., which has lately been incorporated with a capital stock of \$25,000. The directors of the concern are R. C. Dresslar, W. Callahan and J. B. Alexander.

FROM THE WESTERN IMPLEMENT & SUPPLY COMPANY, which has succeeded the wholesale and retail Hardware and Implement firm of Griggs & Moneypenny in Topeka, Kan. J. C. Smith and J. L. Moneypenny, the principal stockholders of the new concern, have formed a stock company, which will be incorporated with a paid up capital of \$20,000 to \$25,000.

FROM BAIRD HARDWARE COMPANY, Charleston, W. Va., which has purchased the business formerly conducted by E. C. Higginbotham & Co. at 402 Charleston street. D. E. Baird, heretofore with N. S. Burlew for over 20 years, will manage the business.

FROM DUNTON HARDWARE COMPANY, which has purchased the business of S. C. Bowles, in Formoso, Kan. The company will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM ATKINSON-STOUT HARDWARE COMPANY, which has succeeded to the business of W. A. Stout in Almena, Kan., retail Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods.

FROM THE GUS REDER HARDWARE COMPANY, Memphis, Tenn., which a few weeks since commenced business at 90 South Second street. The members of the firm are Gus Reder and C. McClelland. The firm will make a specialty of Builders' Hardware and Mechanics' Tools.

WHITE, VAN GLAHN & CO.'S. NEW QUARTERS.

WHITE, VAN GLAHN & CO., 15, 16 and 17 Chatham square, New York, and predecessors, possess the unique distinction of having conducted a General Hardware business at the same address uninterruptedly for 91 years. From a historical standpoint this fact is of general interest; undoubtedly no Hardware house in New York City and few in the United States have occupied the same stand continuously for so long a period. The firm has customers on its books who have bought of them regularly through four generations of the same family. It is understood that this business, in former years under the name of W. N. Seymour & Co., was established in 1812 at the present address, and White, Van Glahn & Co. have the original books of entry showing transactions in 1816. During this period of 91 years New York City has grown in population from less than 100,000 inhabitants to approximately 4,225,000, and the old house has witnessed many noteworthy changes about its historical quarters. The present building was erected on the site of the old Watch Tower, or what was then known as the King's Highway, now Chatham square.

Edward C. Van Glahn, the senior member of the firm, states that the natural growth of the business compelled them some years ago to lease the adjoining building and add it to the one so long occupied, and of late years they have hired any vacant store or basement in the vicinity that became available. The exceedingly rapid business growth of the past few years, however, has taxed the present facilities to the utmost, and the firm is again compelled to seek much larger quarters. Accordingly the entire building at 37 Barclay street, running through to 42 Park place, has been leased. It has five stories, besides basement and subbasement, each 165 ft. deep, and running from street to street. The building is being altered to meet the necessities of a modern Hardware business, and White, Van Glahn & Co. expect to occupy it early in May next. With these greatly enlarged accommodations they expect to concentrate the business as much as possible under one roof, discontinuing the branch store at 49 East Forty-second street, which was opened several years ago. The branch at the original location, Chatham square, will be continued, with headquarters and main office in Barclay street.

Attractive offers have been made for the purchase of the Chatham square property, but Mr. Van Glahn is convinced that real estate dealers are imperfectly qualified to put an accurate value on property which for 91 years has been the center of a successful Hardware business. In any event the rapid growth of this house demonstrates the value of a name backed by almost a century of fair dealing and the good will of such a concern is not easily computed in dollars and cents.

H. A. STILES & Co., 176 Federal street, Boston, manufacturers of Emery, are making a specialty of the Ottoman brand, a Turkish Emery, the product of the famous Red Abbot mines. The carefully selected abrasive is crushed by improved machinery, and after the processes of washing and mulling, grading and cleaning, is shipped in what is known as a salt fish keg, which absolutely prevents drying up and leaking of the keg.

THE UNION MFG. COMPANY, New Britain, Conn., and 103 Chambers street, New York, will, about May 1, remove the New York headquarters to room 107 Havemeyer Building, 26 Cortlandt street. The company has arranged for adequate accommodations for carrying a stock of goods in the basement of the building, the removal to that territory being on account of its greater convenience for an important part of the company's business in lathe chucks, the machinery houses being principally located in that neighborhood.

J. H. Williams & Co.'s. Drop Forging Plant.

Fifth Article.

Trademarks.

It may be said that all of the company's finished merchandise, marketed directly by itself, is trademarked. The additional registered trademark



"Vulcan"

is also added to a number of lines of product, as, for example, C Clamps, Lathe Dogs, Milling Machine Dogs, Eye Bolts, Swivels, Hooks, Rope Sockets, Vulcan Chain Pipe Wrenches and Vulcan Chain Pipe Vises, such goods being particularly required to withstand great strains. For instance, there is made a line of Chain Pipe

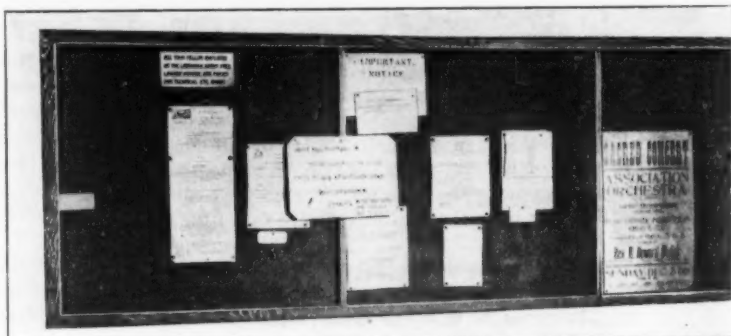


Fig. 24.—Bulletin Board at Main Entrance.

Wrenches from 13¾ in. long over all and weighing but 1¼ lb. to a Wrench to turn up to 18 in. Pipe, 7 ft. 3 in. long, weighing 137 lb., the chain of which has a breaking strain of 40,000 lb.

General Bulletin Board.

At the main entrance is a large three-panel bulletin board, Fig. 24, of wood, hung on the wall on which bulle-

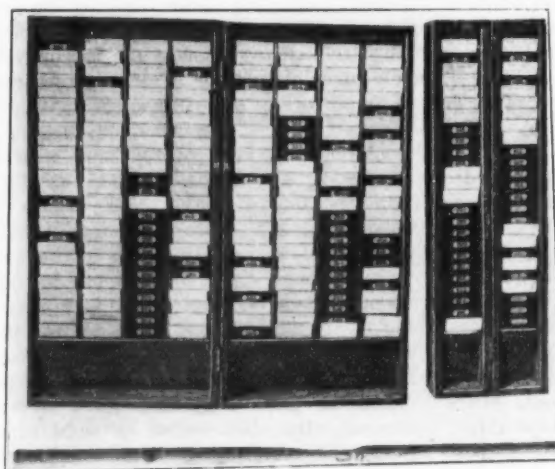


Fig. 25.—Time Card Cabinet.

tins of general interest to the operatives are placarded as they are issued.

Time Card Cabinets.

Just inside the main entrance, leading to the factory inclosure, is one of several time card cabinets, an example of which is illustrated in Fig. 25. In the cabinet are separate receptacles for time cards, each 3½ x 5½ in., the front of which is represented by Fig. 26, the back of it being shown in Fig. 27. Each workman is known by a number, in this instance 357, by which his identity is kept. When he arrives he removes his card from the hinged cabinet, one side of which is marked

"In," pushes it into a receptacle for that purpose in a large time clock, which records his time in the proper space, whether in the "morning," "afternoon" or "overtime" column. On this the total time for the week is computed as a basis for making up the payroll, there being a new card for each week. When he arrives the card is placed in the "In" side of the cabinet, and when he goes out the card is left in the "Out" portion of the two-piece cabinet.

Watchman's Clock.

Stations are located at this point, and all over the works, in the different buildings and on the various floors, which electrically connect with a watchman's clock in the main office, so that as the stated rounds are

THIS SIDE OUT.

No. 357

NAME.

DEC 13 1906

Fig. 26.—Front of Operatives' Time Card.

made the time of the watchman at each station is accurately recorded on a paper dial, inserted daily.

Trimming Room.

From the forge shops the drop forgings are sent to the trimming room, first floor of main building, where the fin or flash, a surplus metal thrown out between the upper and lower dies in the forging process, is removed by means of trimming presses.

Lacquer Room.

Nearby on the same floor is the lacquer room, where certain goods having polished and case hardened surfaces are covered with a lacquer finish to protect them, especially such lines as finished Engineers' Wrenches. The lacquer room is equipped with tables, racks, &c., for handling large quantities of material at a time, of the general character alluded to above. There is a fan in-

WEEK ENDING.....190...

No.

NAME.

DAY	MORNING		AFTERNOON		OVERTIME		TOTAL
	IN	OUT	IN	OUT	IN	OUT	
FRI.							
SAT.							
SUN.							
MON.							
TUE.							
WED.							
THU.							

TOTAL TIME.....HRS.

RATE.....

TOTAL WAGES FOR WEEK \$.....

Fig. 27.—Back of Time Card on Which Clock Mechanism Automatically Records Time.

stalled in the room with which to blow out the fumes emanating from the lacquer, thereby maintaining a good circulation and insuring a purer atmosphere.

Exhaust System and Machinery Guards.

This suggests the mention of similar devices in other portions of the plant, which are pertinent here. In the

polishing and grinding rooms, each wheel has a hood or cover connected with a tube, which in turn is connected with an exhaust blower, to force dust and all particles into the outer air continually, thus greatly benefiting the operative, enabling him to escape much of the injurious effects common to grinding and polishing rooms. There is also another system of pipes entering the forge shops, so that each man has overhead a valve, which he can regulate at will, to secure a graduated current of fresh outdoor air. This feature is particularly grateful in hot weather, as it helps materially to maintain a more comfortable temperature, even on the hottest days. Every dangerous point in the plant is guarded, so far as provision is possible, to prevent injury to employees. The metallic guards for machines are usually of heavy wire screen material of about 3-16 in. gauge; sometimes of sheet iron, to protect gears, belts, revolving pulleys and other working parts, that experience has taught are a source of danger to operatives.

Special Treatment for Stock Forgings.

Stock forgings are specially treated in the hardening department. The details of this important branch of the business were illustrated and described at length in these columns when the existing system was originally adopted several years ago. The necessary degree of heat for any particular purpose, varying frequently with the article, is determined by a carefully arranged system, the degree of heat being increased or decreased according to a regular formula, producing with certainty the results sought, instead of depending on the individual skill of an operative who frequently is guided by the colors developed in the heating processes. The reheating, as it relates to stock forgings, is for the purpose of relieving the strains incidental to the forging operation as well as to increase the strength and toughness of the material, thereby rendering the probability of breaking remote. Pyrometers are used whenever case hardening, drawing or tempering is done.

(To be continued.)

THE STARR MFG. COMPANY, LIMITED, the Dartmouth Rolling Mills, Limited, and the Dartmouth Machine & Forge Company, Limited, Dartmouth, N. S., have been amalgamated, and the business of the three companies will be continued under the name of the Starr Mfg. Company, Limited. The amalgamated companies in addition to the lines hitherto made by the Starr Mfg. Company, Limited, namely, Skates, all descriptions of Bolts, Nuts, Washers, Spikes, Turnbuckles, &c., will manufacture Merchant Bar Iron in Rounds, Squares and Flats, Wrought Iron and Steel Forgings, Carriage Axles, Saw Mill Machinery, Structural Iron Work, and in the near future contemplate additional lines of manufacture. The officers of the new company are: J. C. Mackintosh, president; Jas. Simmonds, vice-president. Directors: Thos. Ritchie, Geo. E. Faulkner, F. H. Oxley, E. D. Adams, H. E. Hill.

THE WARWICK KNIFE COMPANY, Warwick, N. Y., has just been incorporated with a capital stock of \$35,000. The management of the new company is in the hands of experienced and skilled men who have been in the employ of other Cutlery companies in various departments for periods ranging from 15 to 40 years. A fine line of Pen and Pocket Knives will be manufactured, the factory being equipped with the most modern machinery, nothing but the best English steel being used, and the workmen being especially capable men. Patterns particularly desired by the trade will be given special attention, and the company expects to be in a position to handle large quantity orders in 10 months' time. All the goods manufactured will carry the usual warranty, both as to material and finish. The officers of the new company are Hector W. Millspaugh, president; Benjamin F. Vall, vice-president; J. E. Sanford, treasurer, and James T. Young, secretary, with whom are associated as directors, B. B. Sayer, M. N. Kane, F. V. Sanford, F. M. Cummings, W. Q. Minturn, Walter Fuller, James Cryer, H. J. Steer and James Wilkinson.

Export Trade Topics.

PRACTICAL SUGGESTIONS ON EXPORT TRADE.

First Article.—Packing.

THE manufacturer who wishes to extend his export relations, who wishes to build up permanent and profitable foreign connections, who wishes to develop them to the utmost extent possible, finds himself confronted with numerous and complex problems. Some of them involve details so new and strange that he is disposed to ridicule them. But every detail in this business must have most careful attention, no matter how absurd it appears to the beginner. The general rule guiding the conduct of a successful export business may be expressed in one word, absolute, undeviating, *exactitude*.

Most manufacturers who enjoy any export business at all believe themselves adequately posted in the primary principles of the business. Yet mistakes are constantly being made, even ridiculous mistakes, by houses who ought to know better. For instance, complaints by foreign importers are frequent of the nonreceipt or belated receipt of bills of lading, involving a great amount of red tape and unnecessary storage charges.

The study of export business may be classified under three heads:

- 1.—How to obtain export orders.
- 2.—Packing and shipping of export orders.
- 3.—Foreign credits and the collection of accounts from foreign customers.

For present purposes it will be advisable to deviate from the above logical sequence and to assume that export orders are already in hand since No. 1 is largely based on explanations and details involved in Nos. 2 and 3.

Carelessness in Packing.

Probably no comment on American export business for the last half century has been thought complete unless it included an arraignment, more or less caustic, of the carelessness displayed by most of our manufacturers regarding packing for ocean shipment. Further emphasis of this matter may seem unnecessary. Nevertheless the question is vitally important and must be met. And it must be acknowledged that improvements in packing that should have been effected long ago, in view of unceasing criticisms, are scarcely noticeable to-day except in a few individual instances.

Out-Port Observations.

Furthermore, manufacturers of Hardware are sometimes among the worst offenders in this respect. On one occasion recently the writer saw about 300 lb. of Door Knobs packed in second-hand $\frac{3}{4}$ -in. wooden cases originally used for 60 or 70 lb. weight of shoes, or such light stock and so poorly protected that the cases had been smashed into firewood in transit, a large part of the contents had been lost, and the balance was scattered about a certain foreign custom house. Within a few weeks of this occurrence the writer had occasion to notice almost identically the same result in the case of a consignment of American Butts and Hinges. These occurrences are not isolated.

The fact that in both of the instances mentioned the shippers were manufacturers, who for years have been doing an export business of considerable volume, seems to indicate that more impressive sermons on this time-worn, threadbare subject are necessary. Can we get at the root of the trouble? Is it not that shipping clerks often have no personal knowledge of the distinction between domestic and export shipping, and that their chiefs, who ultimately are responsible, have not instructed their subordinates as to facts with which they themselves are or ought to be personally familiar?

Broader Vision.

The difference between shipping export goods and domestic goods is not one of miles. The foreign customer

may be 10,000 miles away, the domestic customer only 200, yet the goods are usually as safe, carry as securely for 10,000 miles in the hold of a steamer as 200 miles in the interior of a freight car. But the ordeal comes in the loading and unloading processes. The shipping clerk who is familiar only with the warehouse trucks and level platforms of our railroad freight depots and cars cannot be expected to realize how steamships are loaded. He must be told, and the lesson should be thoroughly impressed by one who knows.

Most manufacturers nowadays have at least been on board of ocean steamers. They must have witnessed the operation of putting abroad the passengers' baggage. Let the manufacturer imagine the lightly loaded trunks replaced by heavy packages of merchandise, and the same sort of process performed far more roughly in the case of cargo and still more carelessly in many minor foreign ports than in up to date New York or Liverpool.

How Export Goods are Handled.

Cases are not cautiously wheeled in trucks up to steamships' decks and down gently inclined planes to the depths of ships' holds. Great derricks are swung over the ship's sides. Rope slings are lowered to the wharf and circled about a pile of 15 or 20 cases or more, a load of 1 to 2 tons at each trip. The steam winch revolves, the sling tightens. You hear the creaking and cracking of the wooden boxes as the sling compresses and crushes one against the other. Boxes on the exterior of the load, especially at the corners where the ropes pinch worst, have to sustain virtually the whole strain as the sling load rises clear of the floor, dangles in midair, is revolved over the open hatch of the ship, then lowered with a rush 50 or 60 ft. perhaps into the bowels of the vessel.

Does any one imagine that the load invariably touches featherlike? Hardly. Bang! crash! it goes, this load of a ton or two, the cases in the lower tier strained by the weight above them, those on top tumbling down and about, helter skelter, as the sling opens and releases them. The ship arrives at its destination. Precisely the same process is repeated, only in reverse order.

Piling Ossa on Pelion.

In many cases transshipping is necessary—that is, the ship that originally receives the goods does not proceed through to the port of their ultimate destination, and must turn the goods over to another ship. Then the goods are thus handled not twice only, but four, six, even eight times. In many ports ships never lie alongside of wharves, but anchor in midstream or off shore, discharge in the manner described into lighters, from which they may either be similarly unloaded into other ships or on to wharves and thence re-embarked, always in the same care-free fashion, into other lighters, and from them again into other ships.

Coach Packers and Shipping Clerks.

If shipping clerks could only be made to realize what this handling means; if they could watch such operations for even a day, we would not have a fraction of our present complaint as to improper packing. Shipping clerks and packing room employees must be made to understand it, because the loss resulting to the faraway importer, on account of missing or damaged goods directly resulting from flimsy and careless packing, is one of the most exasperating details from which the importer's temper suffers. And exasperation in this respect does not contribute toward eagerness to buy any more of this particular manufacturer's goods than can well be avoided. Yet this sort of thing is happening every day; is still happening as it has been so many years.

Rules for Packing.

Detailed rules or information as to packing would easily necessitate a small volume themselves. The present limited space permits barely the naming of some of them.

1. Always pack in wooden cases, never in bundles or crates if avoidable.
2. Use heavy boxes, never less than $\frac{3}{4}$ -in. stock, for

very heavy goods from 1 to 1½ in. stock, and protect the exterior with battens and iron straps.

3. Pack into the smallest cubic space possible and fill all of the interior.

4. Do not make packages too heavy; far better two cases each of 200 lb. than one of 400 lb.

Crates and bundles should always be avoided; they invariably invite damage and there are very few classes of merchandise that are proof against damage.

Where goods are shipped naked, iron tubes or angle iron for Windmill Towers, for example, use heavy Wire in binding pieces together and protect sharp corners, so that the Wire cannot be cut by contact with edges.

Cases should be completely filled, not only to economize freight charges, but to prevent damage to the contents from shifting. Wherever, as in machinery, it is necessary to leave empty some parts of the case, then such portions should be strongly braced on the inside, in order to withstand the rough shocks of being dumped out of slings and to equalize the pressure from surrounding loads. Otherwise empty parts of cases are almost sure to be crushed in.

Cases in which valuable goods are packed should be lined with tin, hermetically soldered, but ordinarily this practice is more of a nuisance and expense than a benefit.

Pump Wisdom.

Emphasis should be laid on the necessity of the most economical packing, both as to first cost, especially if to be charged on the invoice, and as to using the smallest cubic space. As we shall see when the subject of ocean freights is reached, most goods pay freight not on weight, but on the cubic space occupied. In many articles of low initial cost, particularly those in "competitive" lines, the cost of packing and the freight paid often makes or mars a trade. It is said that the supremacy of two well-known manufacturers of pitcher spout Pumps is very largely due to the fact that they beat their rivals in these two points, close packing making just enough difference in the cost of the goods landed with their foreign customers to kill more than one experiment with other manufacturers, even though factory discounts may be the same.

Loss and Delays Resulting from Careless Packing.

Pieces of cast iron should never by any chance be packed one against the other. Liberal quantities of excelsior or other packing should be interposed. This seems elementary, indeed. Yet in the course of six months abroad last year the writer personally saw no fewer than eight Fly Wheels for small machines arrive broken, because simply laid one on top of the other without any packing whatever.

As a rule, all bright or polished steel that is exposed ought to be greased with vaseline or similar material, small articles packed in greased paper, to protect from rust which the damp sea air is otherwise sure to induce, and every smallest spot must be thus protected. There is a great deal of carelessness by American manufacturers in doing this thoroughly and carefully. Lining cases with waterproof paper is always advantageous, but not always sufficient.

Screws are better than Nails in fastening boxes, especially for the covers, facilitating examination in foreign custom houses, but where costs of boxing must be cut to the minimum, this matter is commonly disregarded.

(To be continued.)

WHEELING CORRUGATING COMPANY, Wheeling, W. Va., whose New York office is located at 47 Cliff street, has found it necessary to enlarge its capacity in this city. A lease has been secured from May 1 of 15,000 sq. ft. of ground floor and basement in what is known as Factory Building No. 2 of the Bush Land Company. The building is located at the Bush Terminal Docks, Brooklyn, and has convenient connections with all railroad lines entering New York, as well as shipping facilities to the Sound, river and coastwise steamers. The new quarters will be operated simply as a shipping warehouse, enabling the company to carry an increased stock and assortment of all its lines, including Galvanized and Black Sheets,

Tin and Terne Plates, Conductor Pipe and Eaves Trough, Steel Lathes, Metal Shingles, Metal Ceilings, Galvanized Pails, Tubs, Ash Cans and Garbage Cans, Copper and Zinc Sheets and Solder. All orders, inquiries, &c., will be attended to at the present warehouse, 47 Cliff street, which will remain the headquarters in this city, and where the company will continue to carry as large a stock as heretofore. The extra warehouse in Brooklyn is required to relieve the over stock in New York.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

REMITTING FOR DEFECTIVE PARTS RETURNED.

FROM A PENNSYLVANIA MERCHANT: We have read with a great deal of interest your editorial on the 2 per cent. cash discount, and we have no doubt but that manufacturers are often imposed upon.

We agree with you that the seller should return the check and insist on payment of the whole amount, but what about the manufacturer or jobber to whom you are obliged to send a half dozen statements and back them up with a sharp "dun" before he will remit to you for some small item that you have returned, because it is defective, or to correct an error in his invoice? These are not "rare occurrences," but true in almost every instance.

TRADE ITEMS.

HARMON & DIXON, 117 Chambers street, New York, manufacturers' agents, have lately added two accounts to their list, Eureka Digger Company, Chicago, manufacturers of post hole diggers, and Bauer & Hardy Mfg. Company, Chicago, who make a line of Door Hangers, Curry Combs and Hardware Specialties.

THE PIDGEON-THOMAS IRON COMPANY, Memphis, Tenn., has succeeded to the business of the Manogue-Pidgeon Iron Company. W. G. Thomas, formerly of the Thomas & Miller Company of Memphis, and Mr. Pidgeon of Manogue-Pidgeon Iron Company, are associated in the new company, which will occupy the same quarters as the old concern, and will operate along the same lines, but on a larger scale. Its principal lines will be Iron and Steel Bars, Black and Galvanized Sheets, Tin Plate, Roofing Goods, Railroad and Mill Supplies, &c. The store is located at 94-96 North Second street, with warehouse at 114 to 136 Tennessee street.

AFTER having practically rebuilt the premises damaged by fire a few months ago, P. & F. Corbin have returned to their former location at 104-106 East Lake street, Chicago. The offices have been tastefully decorated and finished throughout with English bog oak panels and furniture. Details of the sample display room have been worked out with great care and combine features of convenience and elegance. The warehouse arrangement, both for effect and facility in handling goods, is peculiarly adapted for convenience in storage and shipment.

THE GOODELL TOOL COMPANY, Shelburne Falls, Mass., has been incorporated in Massachusetts with capital stock of \$20,000. The Goodell-Pratt Company, Greenfield, Mass., has bought one-half of the stock of the company, but there will be no change in management for the present. Albert D. Goodell, Shelburne Falls, is president and treasurer of the company; Francis R. Pratt, Greenfield, vice-president; Frederick A. Goodell, Shelburne Falls, clerk; directors, these officers and William M. Pratt, Greenfield.

THE GORMULLY & JEFFERY MFG. COMPANY, Chicago, Ill., no longer makes machines for weaving wire mattresses. This department has been taken over by Houchin & Huber, 35-45 Fifty-third street, Brooklyn, N. Y., who make a specialty of machinery for soap, candle, spring bed and bedding manufacturers.

THE BOSTON CONVENTION.

THE exhibition space at the American House, Boston, in connection with the annual convention of the National Hardware Association, in June, is being rapidly taken up by manufacturers who wish to display their goods to the trade. A large portion of the space has already been contracted for, and it is certain that room will be at a premium before the opening of the convention. Among the exhibitors will be Dover Mfg. Company, L. S. Starrett Company, the Simmons Hardware Company, Chandler & Farquhar Company, Bay State Hardware Company, Martin Skate Company, Brown & Sharpe Mfg. Company, Simonds Mfg. Company, E. C. Atkins & Co., Incorporated; H. W. Johns-Manville Company, Meriden Cutlery Company, Heath & Milligan Mfg. Company, Oneida Community, White Lily Washer Company, Stanley Works, Pittsburgh Plate Glass Company, P. D. Beckwith Estate, J. B. Hunter & Co., Corbin Cabinet Lock Company, Yale & Towne Mfg. Company, American Steel & Wire Company, Wheeling Corrugating Company, Harrison Bros. & Co., Incorporated; James H. Prince Paint Company, Carpenter-Morton Company.

MISCELLANEOUS NOTES.

Counting Machines.

The Recording Fare Register Company, New Haven, Conn., has begun the manufacture of a line of counting machines for use on printing presses and automatic machinery where it is desirable to have an accurate record of the output. One of the styles may be attached to the wall and will be adapted for counting merchandise, fruit, &c. The machines are finished in brass or enameled iron cases and register to 100,000, resetting automatically to zero.

The Pritchard-Strong Company's Lamps.

The Pritchard-Strong Company, Rochester, N. Y., has recently added a full line of station and wall lamps, together with tubular and square street lamps, all of the latest styles and designs. The lamps are designed to give considerably more than the usual amount of light.

Phenix Swinging Half Screens.

In our issue of April 11 was given an illustrated description of fixtures for swinging half window screens, offered by Phenix Mfg. Company, Milwaukee, Wis. The company advises us that it carries in stock screens made to cover the lower half of window, and that the screens have the hangers applied, while the fasteners are shipped with the goods. All stock half screens are made on a basis of a two-light window, 4 in. wider than glass width and $4\frac{1}{2}$ in. longer than glass height. The stock

from steel wire. The screens are painted with the best grades of lampblack, ground in boiled linseed oil. Screens are packed one dozen of a size in a crate.

Perfect Handle Hammer.

The H. D. Smith & Co., Plantsville, Conn., manufacturer of the Perfect handle screw drivers, have added to their line the Perfect handle ball pein hammer, views of which are here shown. It is made the same way as the



Fig. 1.—Perfect Handle Hammer.

screw driver referred to and is a solid steel drop forging with handles waterproofed. The latter are pocketed in at each end and securely riveted so that it is asserted they cannot shake or get loose. The steel is especially selected after exhaustive tests and is declared to be the best that can be used. The temper is

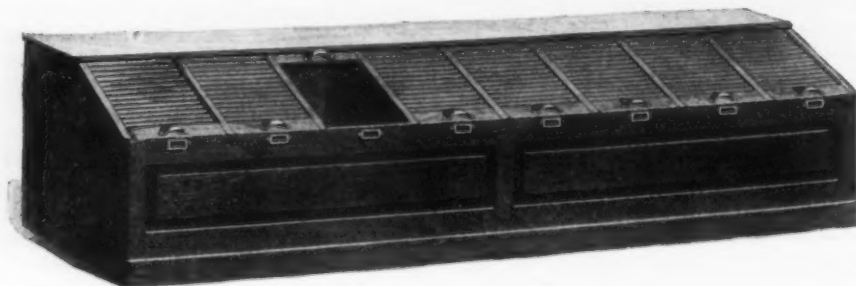


Fig. 2.—Forging of Hammer.

also said to be as nearly perfect as possible, while the hang and spring of the hammer are referred to as of noteworthy excellence. The length of the hammer is 10 in. over all, and the face is 1 1-16 in. in diameter. One half dozen are packed in a sliding cover wooden box, and six dozen in a case.

Heller's Dry Color Bins.

W. C. Heller & Co., Montpelier, Ohio, manufacturers of steel hardware shelf boxes, seed cases, screw and bolt cases, &c., are offering the dry color bins shown in the accompanying cut. They are designed to contain dry colors, kalsomine, glue, seed, &c., and as the makers state, are likely to interest hardware merchants who carry these lines. The bins are 36 in. high, 126 in. wide and 31 in. deep. Each bin has eight compartments, holding a barrel or four bushels to a compartment. The latter are fitted with easy rolling dustproof doors or covers, with strong handles and bronzed card frames. The fronts



Heller's Dry Color Bins.

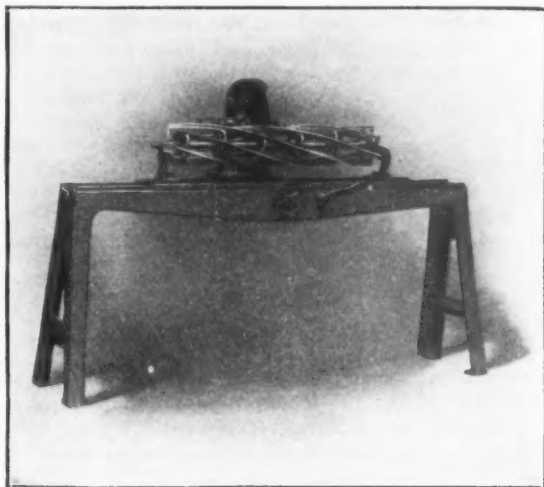
sizes include screens covering glass light 24 x 24 and under; 30 x 30 and under; 36 x 36 and under. Sizes deviating therefrom will be made and shipped within a few days from receipt of order. This permits merchants to supply customers with screens without being obliged to carry a stock of them. The screen frames are made $\frac{7}{8}$ in. thick, firmly put together with hardwood dowel pins and glued. They are covered with the best grades of wire cloth, enameled jet black in color, evenly woven

are paneled with plain ends, so that it is possible to set a row together and add to them at any time. They have steel backs, attached so as not to absorb any dampness when set against a brick wall. The exposure is solid oak of rich antique finish. These bins are carried in stock for immediate shipment and weigh 500 lb.

Willard Hardware & Lumber Company has been incorporated at Willard, Kan., with a capital of \$8000.

Coldwell's Lawn Mower Grinder.

A lawn mower grinder made by the Coldwell Lawn Mower Company, Newburgh, N. Y., is shown in the accompanying cut. The company states that it is offered in response to a considerable demand for a machine suitable for grinding revolving cutters and that it is similar to those used in its factory, although built somewhat lighter, as it is not supposed that equally heavy work



Coldwell's Lawn Mower Grinder.

will be demanded of it. The grinder stands about 36 in. high, so that the hand wheel and lever in front are convenient for the operator to handle. The frame is of sufficient length to grind wipers from 6 in. hand mowers to 40 in. horse mowers, irrespective of the number of blades. The emery wheel is said to be the best obtainable, and it is 14 x 1 1/4 in. in size. Two styles are listed, one with legs, as illustrated, and the other without legs, to stand on a bench.

The Tobaccotton Hoe.

E. C. Atkins & Co., Indianapolis, Ind., is offering the hoe shown in the accompanying cut. The point is made that not only is time saved through being able to sharpen all sides at once, but that from the construction of the eye is impossible for the handle to become loose. The dotted lines in the cut indicate how one side at a time may be brought into use. The blade is well balanced and works well in hard or grassy spots. The tilt is adjusted to the proper angle and the balance of the hoe is



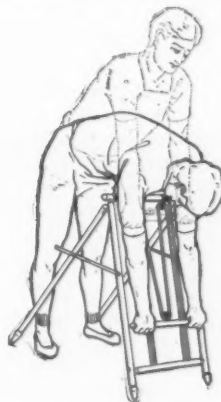
The Tobaccotton Hoe.

such as to give the best results. While especially suited for use on tobacco and cotton plantations the hoe is also adapted to general use.

Bailey's Rubber Exerciser.

The accompanying cut shows an exerciser which is designed to effect the well-known beneficial results to the health of the individual obtained from sawing wood.

The device is referred to as exercising every muscle of the body. The exerciser is practical for men, women and children, and is neat, compact and portable. It is 20 x 36



Bailey's Rubber Exerciser.

in. in size, and is offered by C. J. Bailey & Co., 22 Boylston street, Boston, Mass.

The Bradley Metal Clasp Ceiling Hook.

Atlas Mfg. Company, New Haven, Conn., is offering the ceiling hook, shown herewith. The principal feature is that which gives the line its name, the metal clasp.

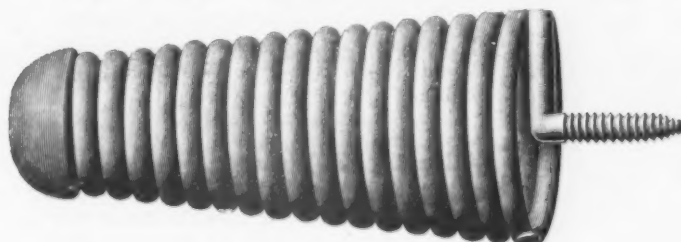


The Bradley Metal Clasp Ceiling Hook.

This grips all the wires together in a bunch at a point which might be termed the base of the hook, furnishing a rigid base which prevents the weaving and working of the wires. The hooks are furnished japanned, coppered and tinned.

Flexible Door Bumper.

The door bumper illustrated herewith is made of coiled wire with a thread cut on one end to screw into



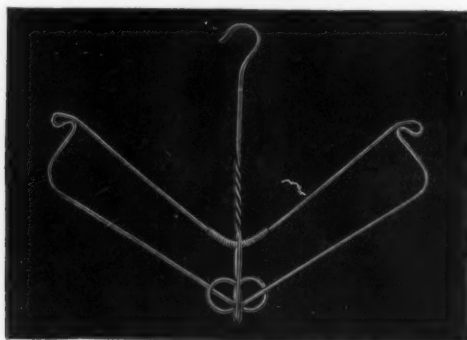
Flexible Door Bumper.

the base board. The flexible feature of the bumper prevents the banging of doors. The bumpers are furnished in ten finishes and are packed one dozen in a box. They are put on the market by the Shelby Spring Hinge Company, Shelby, Ohio, New York office, 84-86 Chambers street.

E. H. Bush has succeeded Bush & Seaver in the Hardware, Stove and Sporting Goods business at Tecumseh, Neb.

Duchess Self Adjusting Skirt Hanger.

The skirt hanger here shown is the product of Pittsburgh Wire Mfg. Company, Pittsburgh, Pa., and is made of tempered steel wire of excellent quality. The feature of the device is an oil tempered steel spring which it is declared will never wear out and which gives



Duchess Self-Adjusting Skirt Hanger.

a uniform elasticity for any skirt to 34 in. waist measure. Attention is also called to the double wires forming the support of the hanger which afford exceptional strength and durability.

Angle Steel Stool No. 20.

Angle Steel Sled Company, Kalamazoo, Mich., is offering the steel stool shown in the accompanying cut. It is made of angle steel, except the top, which is hand painted wood. Every joint is firmly riveted and the



Angle Steel Stool No. 20.

bottoms of legs are finished smooth, so as not to injure floors or carpets. The stool is referred to as unbreakable and as not bending out of shape. It is made in sizes 20, 24, 26, 28 and 30 in. high, and is designed largely for use in factories.

Alligator Y Wrench.

F. J. McCabe, Shelton, Conn., is manufacturing the Improved Alligator Y wrench, here illustrated. Especial



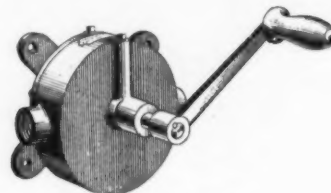
Improved Alligator Y Wrench.

mention is made of the size of the teeth, which are relatively much larger than usual in wrench jaws, thereby insuring a firm grip on pipes, rods, bolts, and the like.

The offset also greatly increases the efficiency of the tool, making it handler in close quarters, especially on work near wall or floor in corners. The wrench is made at present in 10 in. size and is drop forged from good quality steel, is well finished, and can be sold at a moderate price.

Trimount Hand Pump.

The Trimount hand pump, here shown, is offered by A. S. Morss Company, Boston, Mass. It is described as an especially neat and compact device for bilge pump, water pump, gasoline pump and other purposes. It is made in two sizes, No. 1, weighing 10 lb., with a capacity



The Trimount Hand Pump.

of 10 gal. per minute, and No. 2, weighing 20 lb., with a capacity of 20 gal. per minute. No. 1 may be fitted with a wheel for power drive, if desired. Special pumps, blowers and compressors will be supplied to order.

General Service Wrenches in Kits.

The Billings & Spencer Company, Hartford, Conn., has added to its line of specialties a general service wrench kit for use on automobiles or for erecting and



Fig. 1.—General Service Wrenches in Canvas Case.

dismantling plows, carriages, wagons, &c. The kit is put up in two forms—in a special wooden box, nicely finished, and in leather bound canvas or drill case. There are five wrenches in the set, as shown in the illustrations, each with two openings, giving a total of 10 openings,



Fig. 2.—General Service Wrenches in Box.

from $\frac{3}{8}$ in., advancing in eighths to 1 in. The wrench is light and handy but strong, being drop forged from the best bar steel and case hardened.

Ajax Flat Toggle and Plumbers' Toggle.

Ajax Line Material Company, 16 South Jefferson street, Chicago, has added to its line of Ajax Toggle Bolts the flat toggle shown in Fig. 1, and the plumbers' toggle,



Fig. 1.—Ajax Flat Toggle.

Fig. 2. They are intended for fastening to tile or other hollow walls, and like the regular Ajax toggle bolt, have a head piece designed to hold itself in line with the bolt while being inserted in the wall. After insertion, however, a half turn of the bolt by twisting the exposed end drops the head piece into locking position. The flat toggle is designed for use where the object fastened may

need to be removed and replaced. It slips through a 3/8-in. hole, but exposes the nut and the surplus of thread. Sizes are offered 3, 4 and 6 in. in 3-16 or 1/4 in bolts. The plumbers' toggle has a removable cap or head for the

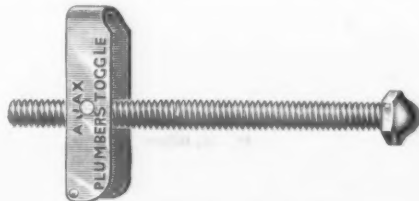


Fig. 2.—Ajax Plumbers' Toggle.

bolt, so that the device can be inserted in the wall before the object to be fastened is slipped over the bolt. After putting the cap in place the whole bolt can be backed into the wall, hiding the surplus thread from view. It is furnished with nicked or plain brass caps, and in the same sizes as the flat toggle mentioned above. Nicked caps are sent unless otherwise specified.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	per gal
Linseed, City, raw.....	42 @43
City, Boiled.....	43 @44
State and Western, raw.....	40 @41
Raw Calcutta, in bbls.....	70 @71
Lard, Extra Prime, Winter.....	77 @78
Extra No. 1.....	56 @58
No. 1.....	50 @54
Cotton-seed, Crude, f.o.b. mills.....	34 @35
Summer Yellow, Prime.....	46 @46 1/2
Summer White.....	50 1/2 @51
Yellow Winter.....	50 1/2 @51
Sperm, Crude.....	59 @60
Natural Winter.....	72 @73
Bleached Winter.....	75 @76
Bleached Winter, Extra.....	@
Tallow, Prime.....	61 @62
Whale, Crude.....	35 @36
Natural Winter.....	46 @47
Bleached Winter.....	48 @49
Extra Bleached Winter.....	50 @51
Menhaden, Brown, Strained.....	32 @33
Light Strained.....	32 @33
Northern.....	@
Southern.....	@
Cocunut, Ceylon.....	9 1/2 @ 9 3/4
Cod, Domestic, Prime.....	37 @38
Newfoundland.....	40 @42
Red, Elaine.....	47 @50
Saponified.....	9 1/2 @ 9 3/4
Olive Italian, bbls., Yellow.....	85 @90
Neufot, Prime.....	56 @57
Palm, Logos.....	7 @ 7 1/4

Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	11 1/2 @12
29 gravity, 15 cold test.....	12 1/2 @13 1/4
Summer.....	11 1/2 @12
Cylinder, light filtered.....	19 @20
Dark, filtered.....	16 1/2 @17 1/4
Paraffine, 908-907 gravity.....	13 @13 1/4
903 gravity.....	13 @13 1/4
902 gravity.....	13 @13 1/4
Red.....	13 @14 1/4

Miscellaneous—

Barytes:	
White, Foreign.....	18.50 @20.50
Amer. floated.....	19.00 @20.00
Off color.....	13.00 @16.50
Chalk, in bulk.....	3.00 @ 3.25
In bbls.....	100 lb @ .35
China Clay, Imported.....	11.00 @17.50
Cobalt, Oxide.....	100 lb @ 2.50
Whiting, Commercial.....	100 lb @ .43 @ .52
Gilders.....	100 lb @ .55 @ .65
Ex. Gilders.....	100 lb @ .60 @ .65
Putty, Commercial—	per 100 lb
In bladders.....	\$1.70 @1.85
In bbls, or tubs.....	1.50 @1.45
In 1 lb to 5 lb cans.....	2.65 @2.35
In 1/2 lb to 50 lb cans.....	1.50 @1.90
Spirits Turpentina—	per gal.
In Oil bbls.....	72 @72 1/2
In machine bbls.....	72 1/2 @73
Glue—	per lb
Cabinet.....	12 @15
Common Bone.....	14 @ 9
Extra White.....	18 @24
Foot Stock, White.....	12 @14
Foot Stock, Brown.....	9 @11
German Hide.....	12 @18
French.....	10 @40
Irish.....	13 @18
Low Grade.....	13 @12
Medium White.....	14 @17
Gum Shellac—	per lb
Bleached, Commercial.....	46 @48
Bone, Dried.....	57 @
Button.....	10 @50
Diamond.....	59 @60
Fine Orange.....	52 @57
A. C. Garnet.....	46 @47
Black Button.....	35 @36
D. C. Chinese.....	53 @64
Octagon B.....	56 @57
T. N.....	48 @49
V. S. O.....	60 @61
Colors in Oil—	per lb
Black, Lampblack.....	12 @14
Blue, Chinese.....	36 @45
Blue, Prussian.....	32 @36

Blue, Ultramarine.....	13 @16
Brown, Vandyke.....	11 @14
Green, Chrome.....	12 @16
Green, Paris.....	12 @24
Sienna, Raw.....	12 @25
Sienna, Burnt.....	12 @15
Umber, Raw.....	11 @14
Umber, Burnt.....	11 @14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9 1/2 @10
Lead, American White:	
Lots of 500 lb or over, in Oil.....	7 1/2 @
Lots less than 500 lb, in Oil.....	@ 8
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ 1/4
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb	
ass'ted tins, add to keg price.....	@ 1 1/2
Lead, American, Terms: For lots 12	
tons and over 1/4¢ rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. no rebate.....	per lb
Zinc, American, dry.....	5 1/2 @ 5 1/4
Zinc, French:	
Antwerp, Red Seal, dry.....	8 1/4
Antwerp, Green Seal, dry.....	10 1/4
Paris, Red Seal, dry.....	9 1/4
Paris, Green Seal, dry.....	11
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	13 1/4 @13 1/2
Lots of less than 1 ton.....	13 1/2 @13 3/4
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	11 1/4 @12 1/4
Lots of less than 1 ton.....	12 1/4 @12 3/4
Discounts—French Zinc—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades 1 1/2%; 25 bbls., 2%; 50 bbls., 4%.	
Dry Colors—	per lb
Black, Carbon.....	8 1/4 @10
Black Drop, American.....	3 1/4 @ 8
Black Drop, English.....	5 @15

Black Ivory.....	16 @20
Lamp, Com.....	4 @ 6
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	31 @33
Blue, Prussian.....	29 @32
Blue, Ultramarine.....	14 1/2 @15
Brown, Spanish.....	1 1/2 @ 1
Carmine, No. 40.....	\$3.10 @3.25
Green, Chrome, ordinary.....	3 1/2 @ 7
Green, Chrome, pure.....	17 @25
Lead, Red, bbls., 1/2 bbls., kegs.....	@ 7 1/4
Litharge bbls., 1/2 bbls., kegs.....	@ 7 1/4
Ocher, American.....	per ton \$3.50 @16.00
American Golden.....	2 1/4 @ 3 1/4
French.....	1 1/4 @ 2
Foreign Golden.....	3 @ 4
Orange Mineral, English.....	10 @12
French.....	10 1/2 @12
German.....	8 1/2 @10
American.....	8 1/2 @ 9
Red, Indian, English.....	4 1/2 @ 6
American.....	3 @ 3 1/4
Red, Turkey, English.....	4 @10
Red, Tuscan, English.....	7 @10
Red, Venetian, Amer.....	per 100 lb \$0.50 @1.25
English.....	100 lb \$1.15 @1.75
Sienna, Italian, Burnt.....	3 @ 6
Powdered.....	3 @ 7
Italian, Raw, Powdered.....	1 1/4 @ 2
American, Raw.....	1 1/4 @ 2
American Burnt and Pow'd.....	1 1/4 @ 2
Talc, French.....	per ton \$18.00 @25.00
American.....	per ton \$15.00 @25.00
Terra Alba, French.....	per 100 lb .90 @ 1.00
English.....	per 100 lb .80 @ 1.00
American.....	per 100 lb .75 @ .80
American.....	per 100 lb .60 @ .65
Umber, T'key, Bnt. & Pow'd.....	2 @ 3 1/4
Turkey, Raw and Powdered.....	2 1/4 @ 3 1/4
Burnt, American.....	1 1/4 @ 2
Raw, American.....	1 1/4 @ 2
Yellow Chrome.....	12 @14
Vermilion, American Lead.....	7 @25
Quicksilver, bulk.....	65 @
Quicksilver, bars.....	65 @
English, Imported.....	65 @70
Chinese.....	\$0.50 @1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½ @ 33½ & 10% signifies

that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ½ doz. \$3.00.....33½%
North's10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See Caps, Cartridges, Shells, &c.

Anti-Rattlers—
Fernald Mfg. Co. Burton Audi-Rattlers, ½ doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.
Fernald Quick Shifter, ½ doz. pairs\$2.00@3.00

Anvils—American—
Eagle Anvils.....½ lb. @ 8½¢
Hay-Budden, Wrought.....½ lb. @ 9½¢
Trenton½ lb. @ 9½¢

Imported—
Peter Wright & Sons, ½ lb. 84 to 349 lb. 11¢; 350 to 600 lb. 11½¢.

Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15&10%

Apple Parers— See Parers, Apple, &c.

Aprons, Blacksmiths'—
Livingston Nail Co.....33½%

Augers and Bits—
Com. Double Spur, 70&5@70&10%
Jennings' Patn., reg. finish.....60&5@60&10%

Black Lip or Blue— 60&5@60&10%

Boring Mach. Augers— 70

Car Bits, 12-in. twist— 40&10%

Ford's Auger and Car Bits— 40&5%

Ft. Washington Auger Co., Concord's— 35%

Forstner Pat. Auger Bits— 25%

C. E. Jennings & Co.: No. 10 ext. list, R. Jennings' list, 25% No. 30, R. Jennings' list, 40&7½%

Russell Jennings— 25&10&2½%

L'Honnedeu Car Bits— 15%

Mayhew's Countersink Bits— 45%

Pugh's Black— 25%

Pugh's Jennings' Pattern— 25%

Snell's Auger Bits— 60

Snell's Bell Hangers' Bits— 60

Snell's Car Bits, 12-in. twist— 60

Snell's King Auger Bits— 50%

Wright's Jennings' Bits— 50%

See Drills, Twist.

Expansive Bits—
Clark's small, 1½; large, 2½.....50&10%
Clark's Pattern, No. 1, ½ doz. 60

No. 2, 1½.....60&10&10%

Ford's, Clark's Pattern— 60

C. E. Jennings & Co., Steer's Pat. 25%

Lavigne Pat., small size, \$18.00; large size, \$26.00.....60&10&10%

Swan's.....60%

Gimlet Bits— Per gro.
Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.75

Hollow Augers—
Bonney Pat., per doz., \$5.50@6.00
Ames2&4 10%
Universal20%

Wood's Universal.....25%

Ship Augers and Bits—
Ship Augers.....40&10%
Ford's33&5%
C. E. Jennings & Co.:15%
Watrous's33&5%
Snell's40%

Awl Hafts— See Handles, Mechanics' Tool.

Awls—
Brad Awls:
Handled.....gro. \$2.75@3.00
Unhanded, Shidered.....gro. \$3.00@3.25
Unhanded, Patent.....gro. \$3.00@3.25

Peg Awls:
Unhanded, Patent.....gro. \$1.50@1.75
Unhanded, Shidered.....gro. \$1.50@1.75

Scratch Awls:
Handled, Com.....gro. \$1.50@1.75
Handled, Socket.....gro. \$1.50@1.75

Awl and Tool Sets— See Sets, Awl and Tool.

Axes—
Single Bit, base weights: Per doz.
First Quality.....\$4.75@5.00
Second Quality.....\$4.25@4.50
Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle

Axles— Iron or Steel
Concord, Loose Collar.....40&5%
Concord, Solid Collar.....40&5%
No. 1 Common, Loose.....3½@4%
No. 1¼ Com., New Styles.....60&4%
No. 2 Solid Collar.....3½@4%
Half Patent.....

Nos. 7, 8, 11 and 12.....70&75%
Nos. 13 to 14.....70&75%
Nos. 15 to 18.....75@75&5%
Nos. 19 to 22.....75@75&5%

Boxes, Axle—
Common and Concord, not turned lb., ½ doz. 45¢
Common and Concord, turned lb., ½ doz. 46¢
Half Patent.....lb., ½ doz. 46¢

Bait— Fishing—
Hendryx:
A Bait.....20%
B Bait.....20%
Competitor Bait.....20&5%

Balances— Sash—
Caldwell new list.....50%
Fullman50&10&60%

Spring—
Spring Balances.....50&10@60%
Chattillon's:
Light Sng. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire— See Wire, Barb.

Bars— Crow—
Steel Crowbars, 10 to 40 lb. per lb., 2½¢@3¢

Towel—
No. 10 Ideal, Nickel Plate.....½ gro. \$8.50

Beams, Scale—
Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ½ doz. \$0.80;
Tinned.....\$0.85
No. 11 Wire Coppered ½ doz. \$1.15;
Tinned.....\$1.20
No. 10 Wire Tinned.....½ doz. \$1.50
Western W. G. Co.:
No. 1 Electric.....½ gro. \$7.80
No. 2 Buffalo.....½ gro. \$9.00
No. 3 Perfection Dust.....½ gro. \$8.00

Egg—
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, \$0.80;
No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. 6, Jap'd, \$1.65.
Lyon, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co.: Improved Dover, per gro., No. 60, \$6.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$3.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Turner & Seymour Mfg. Co.: T. & S. Dover.....\$6.00

Western W. G. Co.: ½ gro., Buffalo, No. 2, \$8.00; Perfection, No. 3, \$9.00.

Wonder (R. M. Co.): ½ gro., net, \$6.25

Bellows—
Blacksmith, Standard List.....65%
Split Leather.....65%
Grain Leather.....60%

Hand—
Inch.....6 7 8 9 10
Doz.....\$5.50 6.15 6.60 7.15 7.70

Molders—
Inch.....9 10 11 12 14 15
Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells— Cow—
Ordinary Goods.....75&5@75&10&5%
High grade.....70&10@75%
Jersey.....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....40@40&10%
Barton Gong.....50%
Home R. & E. Mfg. Co.'s.....35&10%
Trip Gong.....50@50&10%
Yankee Gong.....40&10@50%

Hand—
Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....40&10@50%

**Sizes.....50&10@50&10&5%
Cone's Globe Hand Bells.....33½@35%
Silver Chime.....20&30%**

Miscellaneous—
Farm Bells.....lb., 2½¢@2½¢
Church and School.....60%
Table Call Bells.....50&50&10%

Belting— Leather—
Extra Heavy, Short Lap.....60&5%
Regular Short Lap.....60&10&5%
Standard.....70%
Light Standard.....70&5%
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—
Agricultural (Low Grade).....75@75&5%
Common Standard.....70&70&10%
Standard.....60&5@60&10%
Extra.....60&60&5%
High Grade.....50&5@50&10%

Bench Stops— See Stops, Bench

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$1.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.
Green River Tire Benders and Upsetters.....20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks— Tackle—
Common Wooden.....75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%;
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50&10%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined.....40%
Embossed.....30%

Boards, Wash— See Washboards.

Bobs, Plumb—
Keuffel & Esser Co.....30&4%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread):
¾ x 6 and smaller, 70&12½¢@1%
Larger and Longer, 60&2½¢@1%
Phila. Eagle \$3.00 list May 21, '99

**Bolt Ends.....65@65&5%
Machine, ¾ x 4 and smaller.....70&12½¢@1%
Machine, larger and longer.....60&7½¢@1%**

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knch.
In.....3 4 5 6 8
Per doz. \$0.30 35 45 60 80
Cast Iron Spring Foot, Jap'd:
In.....6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 35 1.25
Wrought Barrel Jap'd, 80@80&10%
Barrel Bronzed.....60&10%
Spring.....70&10@70&10&10%
Shutter.....50&5@50&10&5%
Square Neck.....75@75&10%
Square.....70&10&10%
Ives' Patent Door.....50%

Plow and Stove—
Plow.....65&10@1%
Stove.....85@85&10%

Tire—
Common Iron.....80%
Norway Iron.....80%
American screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82½%
Mount Carmel, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....80%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16, 1891.....82½%
Upon Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch.....1¼ 1½ 1¾ 2
Per doz.....\$1.80 5.60 6.40 8.00
Inch.....2¼ 2½ 2¾ 3
Per doz.....\$5.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme.....15&10%
Perfection.....40%
Seavey's.....40%
Stanley B. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—
Common Ball, American, \$1.25@1.30
Barber's.....50&10&10&60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 411.....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25&10%
P. S. & W. Co., Peck's Pat. 60@60&5%
Stanley B. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—
Wrought Steel.....70&10@75&10%
Griffin's Pressed Steel, 75&10@75&10&5%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink.....50%
Western W. G. Co., Wire.....60&10%

Bright Wire Goods— See Wire and Wire Goods.

Broilers—
Kilbourne Mfg. Co.....75&20%
Western W. G. Co.....80%
Wire Goods Co.....75&75&10%

Buckets, Galvanized—
Mfg'r's list, price per gross, Quart. 14
Water, Reg., 25.35 28.00 32.00
Water, Hvy., 45.35 48.00 52.00
Fire, Rd. Btm. 32.00 31.65 38.65
Well.....37.35 41.35 45.35

Bucks, Saw—
Honsler.....½ gro. \$36.00

Bull Rings— See Rings, Bull

Butts— Brass—
Wrought, High List, Oct. 26, '06, 45@45&16%

Cast Iron—
Cast Brass, Tiebout's.....10%
Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow.....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70&70&5%
Parliament Butts.....70&70&5%

Wrought Steel—
Reversible and Broad.....70&5%
Light Reversible, Light Narrow.....70&5%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest.....65%

Cages, Bird—
Hendryx, Brass: Series 3000, 5000, 1100, 10%; 1200, 25%; 200, 300, 600, 900.....40%

Hendryx Bronze; Series 700, 800, 40%
Hendryx Enamelled, 40%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4 1/4 @ 4 3/4¢
Sharp, 1 prong, per lb., 4 1/4 @ 5 1/4¢
Burke's Blunt, 2 @ 4 1/4¢; Sharp, 4 1/4 @ 5 1/4¢
Gautier, Blunt, 2 @ 4 1/4¢; Sharp, 4 1/4 @ 5 1/4¢
Perkins, Blunt, 2 @ 3.65¢; Sharp, 4.15¢

Cans, Oil—

Cans, Milk—

Illinois Pattern, 1.35 1.35 2.05 each.
New York Pattern, 1.50 2.20 2.45 each.
Baltimore Pattern, 1.50 2.20 2.45 each.
Duluth, 1.35 1.60 1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:
5 10 gal. \$18.00 60.00 125.00 gro., net.

Caps, Percussion—

Eley's E. B. 52 @ 55¢
G. D. 52 @ 55¢
F. L. 52 @ 55¢
G. E. 52 @ 55¢
Musket 52 @ 55¢

Primers—

Berdan Primers, 52 per M. 20¢
Primer Shells and Bullets, 15¢
All other primers per M. \$1.52 @ 1.60

Cartridges—

Blank Cartridges:
32 C. F., 55.50 10.65¢
38 C. F., 57.00 10.65¢
22 cal. Rim, 1.50 10.65¢
32 cal. Rim, 2.75 10.65¢
B. B. Caps, Con. Ball, Sigd., 1.90
B. B. Caps, Round Ball, 1.49
Central Fire, 25¢
Target and Sporting Rifle, 15¢
Primer Shells and Bullets, 15¢
Rim Fire, Sporting, 50¢
Rim Fire, Military, 15¢

Casters—

Bed 65¢
Plate 60¢
Philadelphia 70¢
Acme, Ball Bearing, 33¢
Boss 70¢
Boss Anti-Friction, 70¢
Gem (Roller Bearing), 40¢
Martin's Patent (Phoenix), 45¢
Standard Ball Bearing, 30¢
Tucker's Patent low list, 30¢
Yale (Double Wheel) low list, 50¢

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
3 1/2 1 1/2 5-16 3/4 7-16 1/2 9-16
88.77 6.47 5.02 4.57 4.27 4.22
5/8 3/4 7/8 1 1 1/8 to 1 1/4 inch.
\$4.17 4.07 4.02 4.12
In cash lots, deduct 25¢.
German Coil, 60¢ @ 60¢ @ 70%

Halter—

Halter Chains, 60¢ @ 60¢ @ 70%
German Pattern Halter Chains,
list July 24, '97, 60¢ @ 60¢ @ 70%
Covert Mfg. Co., 35¢ @ 35%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6-3, Straight, with ring, \$28.00
6 1/2-6-2, Straight, with ring, \$29.00
6 1/2-8-2, Straight, with ring, \$32.00
6 1/2-10-2, Straight, with ring, \$37.00

NOTE—Add 2¢ per pair for Hooks.
Twist Traces: add per pair for Nos. 2
and 3, 2¢; No. 1, 3¢; No. 4, 4¢ to price of
Straight Link.

Eastern Standard Traces, Wag-
on Chain, &c., 60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron 60¢ @ 10%
Brass 50¢ @ 10%
Safety and Plumber's Chain,
60¢ @ 10%
Gal. Pump Chain, 1 lb. 4¢ @ 1/2%
Covert Mfg. Co.:
Brest, Halter, Heel, Rein, Stal-
lion, 40%
Oneida Community:
Chains 35¢ @ 2 1/2 @ 40%
Niagara Dog Leads and Kennel
Chains 45¢ @ 60¢ @ 5%
Wire Goods Co.:
Dog Chain, 70¢ @ 10%
Universal Dbl.-Jointed Chain, 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain,
60¢ @ 10%
Sash Chain Attachments, per set, 4¢
Aluminum Sash Ribbon, per 100
ft., \$1.25 @ 33.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)

Carpenters' Blue, 50¢ @ 55¢
Carpenters' Red, 45¢ @ 50¢
Carpenters' White, 40¢ @ 45¢

Checks, Door—

Barley's, 45%
Pullman, per gro., \$54.00
Russwin, 33%

Chests, Tool—

American Tool Chest Co.:
Rosa's Chests, with Tools, 55%
Youths' Chests, with Tools, 10%

Gentlemen's Chests, with Tools, 36%
Farmers' Carpenters', etc., Chests,
with Tools, 22%
Macamists' and Pipe Fitters'
Chests, Empty, 20%
Tool Cabinets, 50%
C. E. Jennings & Co.'s Machinists'
Tool Chests, 33¢ @ 10%

Chisels—

Socket Framing and Firmer

Standard List, 70¢ @ 10¢ @ 75%
Buck Bros., 30%
Charles Buck Edge Tool Co., 30%
C. E. Jennings & Co., 30%
Socket Firmer No. 10, 60%
Socket Framing No. 15, 60%
Swan's, 66¢ @ 70%
L. & I. J. White Co., 30¢ @ 30¢ @ 5%

Tanged—

Tanged Firmers, 30¢ @ 35¢ @ 35%
Buck Bros., 30%
Charles Buck Edge Tool Co., 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co., 25¢ @ 5%

Cold—

Cold Chisels, good quality, 13¢ @ 15¢
Cold Chisels, fair quality, 11¢ @ 12¢
Cold Chisels, ordinary, 9¢ @ 10¢

Chucks—

Almond Drill Chucks, 35%
Almond Turret Six-Tool Chuck, 40%
Buck Pat., each, \$8.00 @ 85%
Empire, 25%
Blacksmiths', 25%
Jacobs' Drill Chucks, 35%
Pratt's Positive Drive, 25%
Skinner Patent Chucks, 40%
Independent Lathe Chucks, 40%
Universal Reversible Jaws, 40%
Combination, Reversible Jaws, 40%
Drill Chucks, New Model, 25%
Standard, 40¢ @ 10%; Skinner Pat.,
25%; Positive Drive, 30%
Planer Chucks, 30%
Face Plate Jaws, 40%
Standard Tool Co.:
Improved Drill Chuck, 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 9, 40%; No. 21, 35%
Scroll Combination, Nos. 82 and
84, 30%
Geared Scroll, Nos. 33, 34 and 35, 30%
Independent Iron, Nos. 18 and 318, 35%
Independent Steel, No. 61, 25%
Union Drill, Nos. 90, 100, 101,
102, 103, 104, 35%
Union Czar Drill, 25%
Universal 11, 12, 16, 17, 13, 14, 15, 35%
Universal, No. 42, 30%
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50, 35%
Steel Face Plate Jaws, Nos. 70 and
72, 30%
Westcott Patent Chucks:
Lathe Chucks, 50%
Little Giant Auxiliary Drill, 50%
Little Giant Double Grip Drill, 50%
Little Giant Drill, Improved, 50%
Oneida Drill, 50%
Scroll Combination Lathe, 50%

Clamps—

Adjustable, Hammers', 20¢ @ 20¢ @ 5%
Carriage Makers', P., S. & W.
Co., 40¢ @ 10¢ @ 50%
Besly, Parallel, 33¢ @ 10%
Lineman's, Utica Drop Forge & Tool
Wood Workers', Hammers', 40¢ @ 10%
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—

Iwan's Champion, Adjustable, 55%
Iwan's Champion, Stationary, 45%

Sidewalk—

Star Socket, All Steel, 40¢ @ 45¢ net
Star Shank, All Steel, 33¢ @ 24¢ net
W. & C. Shank, All Steel, 40¢ @ 24¢
7 1/2 in., \$3.00; 8 in., \$3.25.

Cleavers, Butchers—

Foster Bros., 30%
Fayette R. Plumb, 30%
L. & I. J. White Co., 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each, \$10.75
20th Century Horse, each, \$5.00
Lightning Belt Horse, each, \$15.00
Chicago Belt Horse, each, \$20.00
Stewart's Enclosed Gear
Horse, each, \$17.75
Stewart's Patent Sheep Shear-
ing Machine, each, \$17.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each, \$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80%

Cloth and Netting, Wire—

See Wire, &c.

Cocks, Brass—

Hardware Hat:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
&c., 60¢ @ 10¢ @ 65%
Compression Bibbs, 55¢ @ 10¢ @ 60%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list, 40%
Leather, Walter B. Stevens & Son's
list, 40%

Combs, Curry—

Metal Stamping Co., 40%

Compasses, Dividers, &c.—

Ordinary Goods, 70¢ @ 10¢ @ 75%
Wm. Schollhorn Co.:
Exterior Dividers, 85%
Lock Dividers, 75%

Conductor Pipe—

L. C. L. to Dealers:
Galv. Galvanized
Steel. Charcoal Copper.
Eastern: 70% 50¢ @ 17 1/2% 30%

Central:
60¢ @ 10% 55¢ @ 12 1/2% 20¢ @ 10%
Western and Southern:
65¢ @ 5% 50¢ @ 12 1/2% 20¢ @ 12 1/2%
So. Western:
50¢ @ 25¢ @ 2 1/2% 50% 20¢ @ 5%
Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each, 2 3 4 6 8
Labrador, \$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal., 3 4 6 8
Ice land, ea. \$1.80 \$2.10 \$2.40 \$3.00
Gal., 2 3 4 6 8
Galvanized ea. \$1.85 \$2.25 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal., 2 3 4 6 8
Each, \$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enamelled, 25%; Agate Lined, 25%

Coopers' Tools—

See Tools, Coopers'.

Coopers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 32¢ @ 35¢; lighter
than 3 lb. to pair, 34¢ @ 37¢

Cord—

Sash—
Braided, Drab, 10 lb., 35¢
Braided, White, Com., Nos. 8
to 12, 26¢; No. 7, 26 1/2¢; No. 6,
27 1/2¢.

Cable Laid Italian, lb., No. 18, 37¢
Italian, lb., No. 18, 25¢; No. 22¢
Common India, lb., 11¢ @ 17¢
Cotton Sash Cord, Twisted, 18¢ @ 20¢
Patent Russian, 20¢
Cable Laid Russian, lb., 21¢
India Hemp, Br'd., lb., 21¢
India Hemp, Twisted, lb., 18¢ @ 19¢
Patent India, Twisted, lb., 17¢
Anniston Cordage Co.:
Braided, Nos. 8 to 12, \$0.24; No. 7,
\$0.24 1/2; No. 6, \$0.25 1/2; 50 ft.,
Oriole, \$2.00; 50 ft., Columbia, \$0.85;
50 ft., Victor, \$1.00; 50 ft., 6 Thread,
\$1.10; 60 ft., 3 Thread, \$0.95; 50 ft.,
Manila, \$1.00; 60 ft., Jute, \$0.75.
Pearl Braided, cotton, No. 6, 3¢ @ lb.
27 1/2¢; No. 7, 26 1/2¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12,
26¢; 7, 26 1/2¢; 6, 27 1/2¢.
Harmony Cable Laid Italian, Nos. 7
to 12, 23¢ @ lb.
Pullman:
Wire Sash Cord, 10¢
Sash Cord Attachments, per doz., 10¢
Samson, Nos. 8 to 12:
Braided, 3 lb., Drab Cotton,
55¢; Italian Hemp, 40¢ @ 6¢
50¢; Linen, 65¢; White Cot-
ton, 50¢; Spot Cord, 50¢
Massachusetts, White, 40¢ @ lb.
Massachusetts, Drab, 40¢ @ lb.
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, 35¢ @ lb.
A. Drab, 45¢ @ lb.; White, 40¢;
B. Drab, 40¢; B. White, 35¢;
Italian Hemp, 40¢; Linen, 57 1/2¢
See also Chain and Ribbon.

Wire, Picture—

List July 13, 1906, 85¢ @ 10¢ @ 10%
Hendryx Standard Wire Picture Cord,
old list, 85¢ @ 10%
Turner & Stanton Co. Wire Picture
Cord, 90%
Cradles—
Grain—
40¢ @ 12 1/2%
Crayons—
White Round Crayons, Cases, 100
gro., \$6.50 @ \$7.50 at factory, but
lower prices made by jobbers
Zehle's Lumber, 40¢ @ gro.
White and Purple, Indelible, 75¢
Blue, Red, Green, Yellow and
Terra Cotta, 65¢; Black, 40¢
Giant Lumber, 5 1/4 in. x 15-16 in.
round, all colors, \$16.25; Indel-
ible, \$18.75
Genuine Soapstone, Metal Workers',
5 in. x 3/4 in. Round, \$2.50; 5 in. x
1/4 in. Square, \$1.75; 5 1/2 x 3-16,
\$2.50; 5 x 1/4 x 3-16, \$3.00

Crooks, Shepherds—

Fort Madison, per doz., Heavy, \$7.00;
Light, \$6.50

Crow Bars—See Bars, Crow.

Cultivators—

Victor Garden, 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, 40¢ @ 30¢
Star, Eagle, Rogers & Hamilton
and Anchor, 40¢ @ 30¢
Wm. Rogers & Son, 40¢ @ 30¢

Cutters—

H. H. Mayhew Co., 40%
Red Devil, 50%
Smith & Hemenway Co., 50%
Woodward, 40%

Meat and Food—

American, 401 402 403 404 405 406 407
Each, \$5 \$7 \$10 \$12 \$25 \$50 \$60
Enterprise:
Nos. 5 10 12 22 32
Each, \$2 \$3 \$2.75 \$4.50 \$6 \$25 @ 25¢ @ 7 1/2%
No. 202, \$1.50 40¢ @ 7 1/2%
Dixon's, 2 3 4
Nos., \$14.00 \$17.00 \$19.00 \$30.00
Ideal, 40¢ @ 40¢ @ 5%
Little Giant, 40¢ @ 40¢ @ 5%
Nos., 305 310 312 320 322
Each, \$35.00 \$40.00 \$44.00 \$72.00 \$68.00
N. E. Food Choppers, 25%
New Triumph No. 605, 40¢ @ 30¢ @ 5%

Russwin Food, No. 1, \$24.00; No. 2,

\$27.00; No. 3, \$30.00; No. 4, \$34.00;
Woodruff, 45¢ @ 10¢ @ 10%
Nos., 100 150
\$15.00 \$18.00
Enterprise Beef Shavers, 25¢ @ 30%

Slaw and Kraut—

Henry Dutton & Sons:
Slaw and Kraut Cutters, 33%
Corn Graters, 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife, 40¢ @ doz. \$3.00
Combined Slaw Cutter and Corn
Grater, 40¢ @ doz. \$4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters, 40%
Slaw Cutters, 1 Knife, 40¢ @ gr. \$18.00
Slaw Cutters, 2 Knife, 40¢ @ gr. \$22.00 @ 50%

Tobacco—

All Iron, Cheap, doz. \$4.25 @ \$4.50
Enterprise, 50¢ @ 30%
National, 40¢ @ doz., No. 1, \$21; No. 2,
\$19 40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, 40¢ @ doz. \$24.00 25%
Samson, 40¢ @ doz. \$34.00 25%
Iwan's Improved Post Hole Auger, 40¢ @ doz. \$4.00
Vaughan Pattern Post Hole Augers:
Perfection Post Hole Diggers, 40¢ @ doz. \$6.25
Split Handle Post Hole Diggers, 40¢ @ doz. \$8.75
Split Handle Post Hole Diggers, 40¢ @ doz. \$7.75
Kohler's, 40¢ @ doz. Universal, \$14.00;
Little Giant, \$12.00; Hercules,
\$10.00; Invincible, \$9.00; Rival,
\$8.00; Pioneer, \$7.00
Never-Break Post Hole Diggers, 40¢ @ doz. \$24.00 60%
Dividers—See Compasses.

Drawers, Money—

Tucker's Pat. Alarm Tilt No. 1, 40¢ @ doz. \$18; No. 2, \$15; No. 3, \$12;
No. 4, \$18.

Drawing Knives—

See Knives, Drawing.

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers, 35%
Sterling Wheel Dresser Cutters, 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling
Machines, \$1.50 @ \$1.75
Brest, Millers Falls, 40%
Brest, P., S. & W. 40%
Goodell Automatic Drills, 50¢ @ 60¢ @ 10%
Johnson's Automatic Drills, Nos. 2
and 3, 16%
Johnson's Drill Points, 16%
Millers Falls Automatic Drills, 33¢ @ 10%
Ratchet, Curtis & Curtis, 25%
Ratchet, Parker's, 25%
Ratchet, Weston's, 25%
Ratchet, Weston's, Style H Im-
proved, 40%
Ratchet, No. 012, 40%
Ratchet, Celebrated, 40%
Ratchet, Whitney's, 40%
Whitney's Hand Drill No. 1, \$10.00 @
Adjustable, No. 10, \$12.00 33%

Twist Drills—

Bit Stock, 60¢ @ 10¢ @ 10% @ 70%
Taper and Straight Shank,
60¢ @ 10¢ @ 60¢ @ 10¢ @ 5%

Drivers, Screw—

Screw Driver Bits, per doz., 45¢ @ 50¢
Balsey's Screw Holder and Driver, 40¢ @ doz., 2 1/2 in., \$6; 4 in., \$7.50; 6 in., \$9
Buck Bros' Screw Driver Bits, 50%
Champion, 50%
Disston's, 70%
Edson, 50%
Fray's Hol. H'dle Sets, No. 3, \$12.50
Ford's Brace Screw Drivers, 40¢ @ 10%
Gay's Double Action Ratchet, 35%
Goodell's Auto, 65¢ @ 65¢ @ 10%
Mayhew's Black Handle, 40%
Mayhew's Monarch, 40%
Millers Falls, Nos. 20 and 21, 25¢ @ 10%
Millers Falls, Nos. 11, 12, 41, 42, 15¢ @ 10%
New England Specialty Co., 30%
Smith & Hemenway Co., Never-
turn, 40¢ @ 5%
H. D. Smith & Co.'s Perfect H'dle, 40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 60¢ @ 10%; No.
86, 70%; DeLancey, 70%; Hurwood,
55%
Nos. 7565 to 7568, 50%; No. 7510,
40¢ @ 10%

Eave Trough, Galvanized—

Territory, L. C. L. Galvanized
Galv. Charcoal Copper.
Steel. Iron, 1 1/4, 16¢ @ 20¢ oz.

Eastern—

70¢ @ 30% 70% 30%
Central:
75¢ @ 10¢ @ 2 1/2% 65¢ @ 10% 20¢ @ 10%
Western and Southern:
75¢ @ 12 1/2% 65% 20¢ @ 12 1/2%
So. Western:
75% 60¢ @ 10% 20¢ @ 5%
Terms, 2% for cash. Factory ship-
ments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge, 80%
No. 26, 40%
No. 21, 40%
No. 22, 40%
Copper, 40¢ @ 10%

Elbows, Stove Pipe—

Edwards, Standard Blue, 40¢ @ 10¢ @ 10%
Edwards, Royal Blue, 40¢ @ 10¢ @ 10%
Dover, one piece (R. M. Co.), 40¢ @ 10%
Perfect Elbows, 40%

Emery, Turkish—

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers...30&2%

Hods—Coal—

M'f'g's list, price per gross.
 Galv. Open...\$35 \$39 \$42 \$46
 Jap. Open...26 28 31 35
 Galv. Funnel...43 48 52 56
 Jap. Funnel...33 36 39 43

Masons' Etc.—

Cleveland Wire Spring Co.:
 Steel Brick, No. 122...each \$1.05
 Steel Mortar, No. 138...each \$1.35

Hoes—Eye—

Scovill and Oval Pattern...60&100&60&10&10%

Grub, list Feb. 23, 1899...70&100&75&10%

D. & H. Scovill...30%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, \$2.75; No. 2, \$2.50

Star Double Bit...\$2.20

Ft. Madison Cotton Hoe...70&100&10%

Ft. Madison Crescent Cultivator Hoe...70&100&10%

Ft. Madison Mattock Hoes...70&100&10%

Regular Weight...\$2.65

Junior Size...\$2.40

Ft. Madison Sprouting Hoe...\$2.50

Ft. Madison Dixie Tobacco Hoe...75&100&10%

Kretzinger's Cut Easy...70&100&10%

Warren Hoe...75&100&10%

W. & C. L'ning Hoe...75&100&10%

B. B. 6 in. Cultivator Hoe...\$3.15

B. B. 6 1/2 in. Cultivator Hoe...\$3.35

Acme Weeding...\$2.40, net, \$4.35

W. & C. L'ning Shuffie Hoe...\$4.85

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Angular, \$2.40, doz...45&10%

Door—

Bardley's, Iron, 40%; Brass and Bronze...33&10%

Empire...50%

Pullman...35%

Superior...33&10%

File and Tool—

Nicholson File Holders and File Handles...33&40%

Fruit Jar—

Triumph Fruit Jar Holder, \$2.25 gross, \$10.80; \$2.25 doz...\$1.25

Trace and Rein—

Fernald Double Trace Holder, \$2.25 pairs...\$1.25

Dash Rein Holder, \$2.25 pairs...\$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swat...70%

Hooks—Cast Iron—

Bird Cage, Reading...40%

Clothes Line, Reading List...40%

Clothes Line, Stowell's...70%

Coat and Hat, Reading...70%

Coat and Hat, Stowell's...70%

Coat and Hat, Wrightsville...65%

Harness, Reading List...40%

Harness, Stowell's...60%

School House, Stowell's...70%

Wire—

Belt...80%

Wire C. & H. Hooks...75&75&10%

Columbian Hdw. Co., Gem...70&5%

Parker Wire Goods Co., King...70&10%

Western W. G. Co., Molding...75%

Wire Goods Co.:
 Acme, 60&10%; Chief, 70%; Crown, 75%;
 Czar, 65%; V. Brace, 75%;
 Czar Harness, 50&10%**Wrought Iron—**

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50.

Cotton...doz. \$1.05&1.25

Wrought Staples, Hooks and Nails...See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.

Brush, Light, doz. \$1.75; Medium, \$3.35; Heavy, \$5.35

Grass, beat, all sizes, per doz. \$1.80

Grass, common grades, all sizes, per doz...\$1.30

Whiffletree...lb. 5¢&6¢

Hooks and Eyes:
 Brass...60&45&60&10&45%
 Malleable Iron...70&70&10%

Covert Mfg. Co. Gate and Scuttle Hooks...40%

Ft. Madison Cut-Easy Corn Hooks...\$2.25 net

Turner & Stanton Co. Cup and Shoulder...80&10&10%

Bench Hooks—See Bench Stops.

Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horsehoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, 1/2-in.:

Irons, Soldering

See Copiers.

Jacks, Wagon—

Covert Mfg. Co.:
 Auto Screw...30&2%; Steel, 45%
 Lockport...50%
 Lane's Steel...30&10&2%
 Richards' Tiger Steel, No. 130...50&10%
 Smith & Hemenway Co.'s...25%

Kettles—

Brass, Spun, Plain...\$20&25%
 Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher, &c...30%

Wilkinson Shear & Cutlery Co...60%

Corn—

Wilkinson Shear & Cutlery Co.

Willcut Brand Knives and Hooks, 60%

Withington Acme, \$2.65;

Dent, \$2.75; Adj. Serrated, \$2.20;

Serrated, \$2.10; Yankee No. 1, \$1.50;

Yankee No. 2, \$1.15.

Drawing—

Standard List...75&50&75&10%

C. E. Jennings & Co., Nos. 45, 46, 50%

Jennings & Griffin, No. 41, 42, 75%

Swan's...55&70%

Watrous...16%

L. & J. J. White...20&5&25%

Hay and Straw—

Serrated Edge, per doz. \$5.50&5.75

Iwan's Sickle Edge...\$2.30

Iwan's Serrated...\$2.10

Mincing—

Buffalo...\$13.00

Miscellaneous—

Farriers'...doz. \$3.00&3.25

Westenholm's...\$3.00&3.25

Knobs—

Base, 2 1/2-in. Birch, or Maple,

Rubber Tip...gro. \$1.25&1.40

Carriage, Jap., all sizes...gro. 40&45¢

Door, Mineral...doz. 65&70¢

Door, Por. Jap'd...doz. 70&75¢

Door, Por. Nickel...doz. \$2.05&2.15

Bardley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Allith Mfg. Co., Reliable...50%

Lane's Store...25%

Myers' Noiseless Store Ladders...50%

Richards Mfg. Co.:
 Improved Noiseless, No. 112...50%
 Climax Shelf, No. 113...50%
 Trolley, No. 109...50%**Ladies, Melting—**

L. & G. Mfg. Co. (low list)...25%

P. S. & W...40&10%

Reading...60%

Lanterns—Tubular—

Regular Tubular, No. 0...doz. \$4.25&4.50

Lift Tubular, No. 0...doz. \$4.75&5.00

Hinge Tubular, No. 0...doz. \$4.75&5.00

Other Styles...40&40&5%

Bull's Eye Police—

No. 1, 2 1/2-in. \$2.75&3.00

No. 2, 3-in. \$3.00&3.25

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron...50%

Stowell's Badger, Cast Iron...50%

Latches—Thumb—

Roggin's Latches, with screw...doz. 35&40¢

Door—

Allith Mfg. Co., Automatic, No. 400, \$2.00 doz...\$4.00

Cronk & Carrier Mfg. Co., No. 101, \$2.00 doz...\$2.00

Cronk & Carrier Mfg. Co., Latch, Haap and Staples...50%

Richards' Bull Dog, Heavy, No. 122...50&5%

Richards' Trump, No. 127...\$1.50

Stowell's Steel...50%

Leaders, Cattle—

Small...doz. 50¢; large, 60¢

Covert Mfg. Co.:
 Cotton, 45%; Hemp, 45%; Jute, 35%;
 Sinal, 20%**Lifters, Transom—**

R. & E...10%

Lines—

Wire Clothes, Nos. 15 19 20

100 feet...\$2.25 2.00 1.75

75 feet...\$1.75 1.35 1.10

Anniston Waterproof Clothes, 50 ft., \$2.00 gro. \$2.00; Gilt Edge, \$2.50; Air Line, \$2.00; Acme, \$18.00; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$11.50; Standard, \$10.50; Columbia, \$9.50; Allston, \$13.50; Calhoun, \$12.00.

Samson Cordage Works:
 Solid Braided Chalk, Nos. 6 to 3, 40%
 Solid Braided Mason's, No. 0, 30%
 Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.
 Mason's Lines Shade Cord, &c.:
 White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75; Lines, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50.
 Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50.
 Clothes Lines, White Cotton, 50 ft., \$2.75; 80 ft., \$3.25; 90 ft., \$3.75; 125 ft., \$4.00; 150 ft., \$4.25; 175 ft., \$4.75; 200 ft., \$5.25.**Locks—Cabinet—**

Cabinet Locks...23 1/2%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co...40%

R. & E. Mfg. Co...10%

Elevator—

Stowell's...50%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass...75&10%

Sash, &c.—Ives' Patent:
 Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash, Lock, 33 1/2%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.

Pullman Patent Ventilating Lock...35%

Reading...40%

Machines—Boring—

Com. Up'r'l, without Augers...\$2.00&2.25

Com. Ang'l'r, without Augers...\$2.25&2.50

Swan's Improved...40&10%

Jennings Nos. 1 and 4...33 1/2%

Miller's Patent...5%

Snell's, Upright, \$2.65; Angular, \$2.90

Corking—

Reisinger Invincible Hand Power...\$18.00

Fence—

Williams' Fence Machines...each \$5.50

Hoisting—

Moore's Anti-Friction Chain Hoist...30%

Moore's Hand Hoist, with Lock Brake...20%

Moore's Cyclone High Speed Chain Hoist...25%

Ice Cutting—

Chandler's...12 1/2%

Washing

Boss Washing Machine Co.: Per doz.

Boss No. 1...\$57.00

Boss Rotary...\$57.00

Champion Rotary Banner No. 1...\$57.00

Standard Champion No. 1...\$50.00

Standard Perfection...\$27.00

Cincinnati Square Western...\$33.00

Uneda American, Round...\$33.60

Mallets—

Hickory...45&50%

Lignumvitae...45&50%

Tinnars' Hickory and Apple-wood...45&50%

Mangers, Stable—

Swett Iron Works...50%

Mashers, Vegetable

Western, W. G. Co., Potato...60&10%

Mats, Door

Elastic Steel (W. G. Co.) new list...50%

Keystone Wire Matting Co.:
 Keystone...50%
 Ideal...50%**Mattocks—**

See Picks and Mattocks.

Milk Cans—See Cans, Milk.**Mills, Coffee, &c.—**

Enterprise Mfg. Co...20&25%

National list Jan. 1, 1902...30%

Parker's Columbia & Victoria...30%

Parker's Box and Side...50&10&60%

Swift, Lane Bros. Co...30%

Motors Water—

Divine's Red Devil...30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted

Cheapest...all sizes, \$1.85&2.00

Cheap...all sizes, \$2.00&2.50

Better Grade...all sizes, \$2.50&4.50

12 1/2 16 18 in.

High Grade...\$4.50 4.75 5.00 5.25

Continental...60&5%

Great American...70%

Great American Ball B'r'g, new list...70%

Quaker City...70%

Pennsylvania, Jr. Ball Bearing...60&5%

Pennsylvania Golf...50%

Pennsylvania Horse...33 1/2&5%

Pennsylvania Pony...40&5%

Granite State:
 Style A, Low Wheel...70&10&10%
 Style B, Low Wheel...70&10&10%
 Style C, High Wheel, spcl. disc't...70&10%

Style D, High Wheel, spcl. disc't...70%

Philadelphia:
 Styles M., S. C. K., T...70&10&5%
 Style A, Low Wheel...60&10&5%
 Style E, High Wheel...70&10&5%
 Drexel and Gold Coin, special list...40%

Horse...40&5%

Pony...40&5%

36-in. Horse...30&10%

Eagle Horse...30&5%

L. K. L. Horse...50%

Nails—

Wire Nails and Brads, Miscellaneous...87 1/2&87 1/2&10%

Cut and Wire. See Trade Report.

Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Anchor...23 21 20 19 18...40&5%

Potato—	
Saratoga.....	doz. \$7.00
White Mountain.....	doz. \$6.00
Picks and Mattocks—	
List, Feb. 23, 1899.....	7045@7045
Cronk's Handled Garden Mattock,	
doz. No. 2, \$2.60; No. 3, \$2.40.	
Pinking Irons—	
See Irons, Pinking.	
Pincers—	
Vaughan & Bushnell Mfg. Co.:	
Blacksmiths', per doz., 10 in.,	
\$5.00; 12 in., \$5.50; 14 in., \$6.00.	
Carpenters' Claw, per doz., 6 in.,	
\$2.00; 8 in., \$2.75; 10 in., \$3.50.	
Pins, Escutcheon—	
Brass.....	5045@5045
Iron, list Nov. 11, '85.....	6045@6045
Pipe, Cast Iron Soil—	
Carload lots.	
Standard, 2-6 in. 5045@5045	
Extra Heavy, 2-6 in. 6545@6545	
Fittings.....	7045@7045
Pipe, Merchant—	
Consumers, Carloads.	
Steel.	
Blk. Galv. Blk. Galv.	
1/4 & 1/2 in. 60 5945 4545	
3/4 in. 63 54 6145 4545	
1 in. 70 58 6345 4545	
1 1/4 in. 74 64 6845 4545	
2 in. 80 64 6845 4545	
2 1/2 in. 85 64 6845 4545	
Pipe, Vitrified Sewer—	
Carload lots.	
Standard Pipe and Fittings, 8	
to 24 in., f.o.b. factory:	
First-class.....	84
Second-class.....	87
NOTE.—Market irregular.	
Pipe, Stove—	
Per 100 joints.	
Edwards' Nested: C. L. C. L.	
5 in., Standard Blue.....	72 72
6 in., Standard Blue.....	75 75
7 in., Standard Blue.....	77 75
8 in., Standard Blue.....	79 80
9 in., Standard Blue.....	81 80
10 in., Standard Blue.....	83 80
11 in., Standard Blue.....	85 80
12 in., Standard Blue.....	87 80
Planes and Plane Irons—	
Wood Planes—	
Bench, first qual.....	3045@3045
Bench, second qual.....	4045@4045
Molding.....	2545@2545
Bailey's (Stanley R. & L. Co.).....	3545@3545
Chapin-Stephens Co.:	
Bench, First Quality.....	30
Bench, Second Quality.....	30
Molding and Miscellaneous.....	25
Toy and German.....	30
Union.....	30
Iron Planes—	
Bailey's (Stanley R. & L. Co.).....	3545@3545
Chapin's Iron Planes.....	4045@4045
Miscellaneous Planes (Stanley R. & L. Co.).....	3045@3045
Union.....	3045@3045
Plane Irons—	
Wood Bench Plane Irons, list	
Dec. 12, '06.....	25
Buck Bros.....	30
Chapin-Stephens Co.....	25
Stanley R. & L. Co.....	35
Union.....	30
L. & L. White.....	2545@2545
Planters, Corn, Hand—	
Kohler's Eclipse.....	doz. \$8.00
Plates—	
Felco.....	10 1/4
Self-Sealing Pie Plates.....	50
Co. doz. \$2.00.....	50
Pliers and Nippers—	
Button Pliers.....	75@7545
Gas Burner, per doz., 5 in., \$1.25	
@ \$1.50; 6 in., \$1.45 @ \$1.50.	
Gas Pipe.....	7 1/2 12-14 18-20
\$2.00 \$2.25 \$2.75 \$3.50	
Acme Nippers—	
Cronk & Carrier Mfg. Co.:	
American Button.....	80
Improved Button.....	7545@7545
Cronk's.....	60
No. 80 Linemen's.....	50
Stub's Pattern.....	45
Combination and others.....	35
Heller's Farriers' Nippers, Pincers	
and Tools.....	4045@4045
The Nettleton Mfg. Co. Reversible	
Cutting Nippers.....	40
Z. S. & W. Timmers' Cutting Nip-	
pers.....	60
Wm. Schellhorn Co.:	
Bernard, 33 1/2%; Elm City, 33 1/2%;	
Paragon, 50%; Lodi, 50%.	
Swedish Side, End and Diagonal Cut-	
ting Pliers.....	50
Utica Drop Forge & Tool Co.:	
Pliers and Nippers, all kinds.....	40
Vaughan & Bushnell Mfg. Co.:	
Gas Burner, per doz., 5 in., \$2.50;	
6 in., \$3.00.	
Gas, per doz., 7 in., \$3.50; 8 in.,	
\$3.75; 10 in., \$4.50.	
Nippers, Horseshoers' Cutting, 40%;	
Roof Faring.....	40
Plumbs and Levels—	
Chapin-Stephens Co.:	
Plumbs and Levels.....	3045@3045
Chapin's Imp. Brass Cor. 4045@4045	
Pocket Levels.....	3045@3045
Extension Sights.....	3045@3045
Machinists' Levels.....	4045@4045
Diston's Plumbs and Levels.....	6045@6045
Diston's Pocket Levels.....	6045@6045
C. E. Jennings & Co.'s Iron.....	33 1/2
C. E. Jennings & Co.'s Iron, Adjust-	
able.....	4045@4045
Stanley R. & L. Co.....	40
Stanley's Duplex.....	35
Woods' Extension.....	33 1/2
Poachers, Egg—	
Buffalo Steam Egg Poachers, doz.	
No. 1, \$2.00; No. 2, \$2.00; No. 3,	
\$2.00; No. 4, \$2.00.....	50
Points, Glaziers—	
Bulk and 1-lb. papers.....	10 1/4
14-lb. papers.....	10 1/4
1/4-lb. papers.....	10 1/4

Pokes, Animal—	
Ft. Madison Hawkeye.....	doz. \$3.25
White Madison Western.....	doz. \$4.00
Police Goods—	
Manufacturers' Lists.....	
Tower's.....	
Polish—Metal, Etc—	
Glasbrite, No. 2, 5 lb can (powder),	
each, \$1.25; doz., \$12.00; No. 2, 10 lb	
can (cake), each, \$2.50; doz., \$24.00.	
Prestoline Liquid, No. 1 (1/4 pt.),	
doz., \$3.00; No. 2 (1 qu.), \$9.00.....	40
Prestoline Paste—	
George William Hoffman:	
U. S. Metal Polish Paste, 3 oz.	
boxes, doz. 50¢; doz. gro. \$4.50;	
1/2 lb boxes, doz. \$1.25; 1 lb	
boxes, doz. \$2.25.	
U. S. Liquid, 8 oz. cans, doz.,	
\$1.25.	
Barkeepers' Friend Metal Polish,	
doz., \$1.75.	
Stove—	
Black Eagle Benzine Paste, 5 lb cans,	
doz. \$1.00; 1 lb. cans, doz. \$1.00	
Black Eagle, Liquid, 1/4 pt. cans,	
doz. \$1.00.	
Black Jack Paste, 1/4 lb cans, doz. \$1.00	
Black Kid Paste, 5 lb cans, each, \$0.65	
Ladd's Black Beauty Liquid, per	
100 tins.....	\$6.75
Joseph Dixon's, per gr. \$5.75.....	10
Dixon's Plumbago.....	10
Firestone, per gr. \$1.50.....	10
Gem, per gr. \$1.50.....	10
Japanese.....	10
Jet Black.....	10
Peerless Iron Enamel, 10 oz. cans,	
doz. \$1.50.	
Wynn's Black Silk:	
Paste, cans, doz., 5 oz., \$0.75;	
1/2 lb., \$1.00; 1 lb., \$1.00.....	1.75
Paste, 5 lb cans, doz. \$0.70	
Liquid, cans, doz., 6 oz., \$0.75;	
1/2 pt., \$1.00; 1 pt., \$1.00.....	1.75
Steel Range Enamel, doz., 1/4 pt.,	
\$1.00; 1/2 pt., \$1.25.	
Poppers, Corn—	
1 qt. Square.....	doz. \$0.80; gro. \$8.00
1 qt. Round.....	doz. \$0.90; gro. \$9.00
1 1/2 qt. Square.....	doz. \$1.00; gro. \$10.00
2 qt. Square.....	doz. \$1.20; gro. \$12.00
Post Hole and Tree Au-	
gers and Diggers—	
See also Diggers, Post Hole, do.	
Posts, Steel—	
Steel Fence Posts, each, 5 ft., 4¢;	
6 ft., 4¢; 6 1/2 ft., 4¢.	
Steel Hitching Posts.....	each \$1.30
Potato Parers—	
See Parers, Potato.	
Pots, Glue—	
Enamelled.....	3545@3545
Tinned.....	3045@3045
Powder—	
In Canisters:	
Duck, 1 lb.....	each 45¢
Fine Sporting, 1 lb.....	each 75¢
Rifle, 1/2 lb.....	each 15¢
Rifle, 1 lb.....	each 25¢
In Kegs:	
12 1/2-lb. kegs.....	\$3.50
25-lb. kegs.....	\$4.50
King's Semi-Smokeless:	
Keg (25 lb bulk).....	\$4.50
Half Keg (12 1/2 lb bulk).....	\$3.50
Quarter Keg (6 1/4 lb bulk).....	\$1.90
Case 24 (1 lb cans bulk).....	\$4.50
Half case (1 lb cans bulk).....	\$4.50
King's Smokeless:	
Keg (25 lb bulk).....	\$12.00
Half Keg (12 1/2 lb bulk).....	6.25
Quarter Keg (6 1/4 lb bulk).....	3.25
Case 24 (1 lb cans bulk).....	14.00
Half case 12 (1 lb c. bk.).....	7.25
Robin Hood Sm'less Shot Gun.....	5045@5045
Presses—	
Fruit and Jelly	
Enterprise Mfg. Co.....	2045@2045
Seal Presses—	
Morrill's No. 1, doz., \$20.00.....	50
Pruning Hooks and Shears	
See Shears.	
Pullers, Nail—	
Cyclops.....	50
Miller's Falls, No. 3, doz., \$12.00.	
Morrill's No. 1, Nail Puller, doz.	
\$20.00.....	50
Pearson No. 1, Cyclops Spike Puller,	
each \$30.00.....	50
Scranton, Case Lots:	
No. 2B (large).....	\$5.50
No. 3B (small).....	\$5.50
Smith & Hemmway Co.:	
Diamond B, case lots, doz., Large,	
\$9.00; Small, \$7.50.	
Giant No. 1, doz., \$18; No. 1 1/4,	
\$18.50; No. 3, \$15.....	35
Staple Pullers, Utica and Davi-	
son.....	60
Parrot Tack and Stub Puller, doz.,	
75¢; doz. gro., \$6.00.	
Pulleys, Single Wheel—	
Inch.....	1 1/2 1 3/4 2 3
Avening or Tackle.....	doz. \$0.50 .35 .60 1.05
Hay Fork, Sichel or Solid Eye,	
doz., 4 in., \$1.25; 5 in., \$1.55	
Inch.....	2 1/4 2 1/2 2 3/4
Hot House, doz.....	\$0.65 .85 1.20
Inch.....	1 1/2 1 3/4 2
Screw, doz.....	\$0.16 .19 .25
Inch.....	1 1/2 1 3/4 2
Side, doz.....	\$0.25 .30 .35
Inch.....	1 1/2 1 3/4 2
Stowell's:	
Ceiling or End, Anti-Friction.....	6045@6045
Dumb Waiter, Anti-Friction.....	6045@6045
Electric Light.....	60
Side, Anti-Friction.....	6045@6045
Sash Pulleys—	
Common Frame; Square or	
Round End, per doz, 1 1/2 and	
2 in.....	
Auger Mortise, no Face Plate	
per doz., 1 1/2 and 2 in.....	

Acme, No. 35, 1 1/2 in., 18 1/2¢; 2 in., 20 1/2¢
 For-All-Steel, Nos. 3 and 4, 1 1/2 in., 18 1/2¢; 2 in., 20 1/2¢
 Grand Rapids All Steel Noiseless.....7045¢
 Ideal.....7045¢
 Niagara, No. 25, 1 1/2 in., 18 1/2¢; 2 in., 20 1/2¢
 No. 26, Troy, 1 1/2 in., 18 1/2¢; 2 in., 16 1/2¢
 Star, No. 26, 1 1/2 in., 18 1/2¢; 2 in., 20 1/2¢
 Tackle Blocks—See Blocks.

Pumps—
 Cistern.....60¢
 Pitcher Spout.....7545@7545¢
 Wood Pumps, Tubing, do. 4545@4545¢
 Barnes Dbl. Acting (low list).....4045¢
 Barnes Pitcher Spout.....7545¢
 Contractors' Rubber Diaphragm No.
 2, B. & L. Block Co.....\$16.00
 Daisy Spray Pump.....\$6.50
 Flint & Walling's, Fast Mail Hand,
 (low list).....55¢
 Flint & Walling's Fast Mail (low
 list).....55¢
 Flint & Walling's Tight Top Pitcher,
 7545@7545¢
 National Specialty Mfg. Co. Measur-
 ing Nos. 2, \$6.00; 3, \$5.50.....30¢
 Myers' Pumps (low list).....4045¢
 Myers' Power Pumps.....4045¢
 Myers' Spray Pumps.....4045¢

Pump Leathers—
 Plunger and Lower Valve—Per
 gro.:
 Inch... 2 2 1/4 2 1/2 2 3/4 3 1/8
 \$2.80 2.50 2.75 3.00
 Inch... 3 3 1/4 3 1/2 3 3/4 4 1/4
 \$3.30 3.60 3.85 4.10 4.40
 Plunger Cup Leathers—Per 100:
 Inch... 2 1/2 3 3 1/4 3 1/2 4
 \$2.75 3.85 5.00 6.00

Punches—
 Saddlers' or Drive, good.....doz. 50¢@75¢
 Spring, single tube, good qual-
 ity.....\$1.75@2.00
 Revolving (4 tubes).....doz. \$3.50@3.75
 Bemis & Call Co.'s Cast Stl Drive—50¢
 Morrill's Nos. 1A, 1A, 1B, 1C,
 \$1.50.....50¢
 Hercules, 1 die, each \$5.00.....50¢
 Niagara Hollow Punches.....40¢
 Niagara Solid Punches.....55¢@10¢
 Wm. Schollhorn Co.:
 Belt and Ticket, Bernard, 33 1/2%
 Paragon, 50%; Lodi, 50%.....60¢
 Tinners' Solid, P. S. & W. Co. 33 1/2%
 Tinners' Solid, P. S. & W. Co., 33 1/2%
 doz., \$1.44.....50¢

Rail—Barn Door, do.—
 Sliding Door, Painted Iron.....2 1/2¢@2 3/4¢
 Sliding Door, Wrought Brass,
 1 1/2 in., lb. 36¢.....30¢
 Allith Mfg. Co.: Reliable Hanger
 Track.....50¢
 Cronk's:
 Double Braced Steel Rail, 1/2 ft. 3 1/4¢
 O. N. T. Rail.....3¢
 Hinge Rail, No. 65.....33¢@3¢
 Griffiths:
 xxx, 100 ft., 1 x 3-16 in., \$3.00;
 1 1/4 x 3-16 in., 3.50.
 Hinged Hanger, 100 ft., 1 x 3-16
 in., \$3.10; 1 1/4 x 3-16 in., \$3.80.
 Lane's:
 Hinged Track, 100 ft., 1 in., \$3.40;
 1 1/4 in., \$3.90.
 O. N. T. 100 ft., 1 in., \$3.00; 1 1/4
 in., \$3.60; 1 1/2 in., \$4.00.
 Standard, 1 1/4 in., 100 ft. \$4.00
 Lawrence Bros.:
 100 ft. No. 201, \$4.00; No. 202, \$4.00
 New York, 1 x 3-16 in., 100 ft. \$3.00
 McKinney's:
 Hinged Hanger Rail, 1/2 ft., 1 1/4¢
 None Better.....1/2 ft. 3 1/4¢
 Standard.....1/2 ft. 4¢
 Myers' Stayon Track.....60¢@10¢
 Richards' Mfg. Co.:
 Common, 1 x 3-16 in., \$3.00; 1 1/4 x
 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.
 Special Hinged Hanger Rail.....60¢@10¢
 Lag Screw Rail, No. 65.....50¢
 Gauge Trolley Track, 1/2 ft., No. 3,
 9¢; No. 32, 14¢; No. 33, 20¢
 No. 30.....60¢@10¢
 Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
 \$4.00; 65, \$3.25; 66, \$3.50; 67, \$3.75;
 \$3.25; 49, No. 2, \$3.50.
 Stowell's:
 Cast Rail.....1/2 ft. 2 1/4¢
 Steel Rail, Plain.....25¢
 Wrought Bracket, 1 3-16 in.....1/2 ft. 3¢
 Wrought Bracket, 1 1/2 x 5-16.....1/2 ft. 1¢
 Swett's Hyllo, 1/2 ft. 1 1/4¢.....60¢
 P. L. B. Steel Rail.....100 ft. \$3.00
 No. 0, 1 x 3-16.....100 ft. \$3.00

Rakes—
 NOTE.—Many goods are sold
 at net prices.
 Fort Madison Red Head Lawn.....\$3.25
 Fort Madison Blue Head Lawn.....\$2.70
 Jackson Lawn, 29 and 30 teeth, 1/2
 doz., net.....\$4.25
 New Champion Garden, 10 doz., 12
 teeth, \$15.00; 14, \$16.50; 16, \$18.00; 15¢
 Victor Garden, 10 doz., 12 teeth,
 \$15.00; 14, \$16.50; 16, \$18.00.....80¢
 Queen City Lawn, 10 doz., 20 teeth,
 \$2.85; 24, \$3.00.....net
 xxx, 10 doz., 12 teeth.....\$4.00
 Malleable Garden, 10 doz., 12 teeth,
 \$15.00; 14, \$16.00; 16, \$18.00.....80¢
 Ideal Steel Garden, 10 doz., 12 teeth,
 \$15.00; 14, \$16.00; 16, \$18.00.....80¢
 Kohler's:
 Lawn Queen, 20-tooth.....1/2 doz. \$2.00
 Lawn Queen, 24-tooth.....1/2 doz. \$3.30
 Watson, 20-tooth.....1/2 doz. \$2.70
 Paragon, 24-tooth.....1/2 doz. \$2.40
 Steel Garden, 14-tooth.....1/2 doz. \$2.70
 Malleable Garden, 14-tooth, 1/2 doz.
 \$1.75@2.00

Rasps, Horse—
 Dieston's.....75¢
 Heller Bros., 70A-5077A-10A-5¢
 Liveright Bros.' Gold Metal 70A-10075¢
 New Nicholson.....70¢@10¢75¢
 See also Files.

Razors
 Diana Ro-Ras-1c.....60¢
 For-Razors, 10 doz., No. 42, 60¢; 10
 No. 44, \$3.00; No. 42, Platin.,
 \$25.00

Turkey Oil Stones, Extra, 5 to 8 in.....	39 D 80¢
Queer Creek Stones, 4 to 8 in.....	20¢
Queer Creek Slips.....	40¢
Sand Stone.....	2¢

